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Electrical Contracting

April 1934

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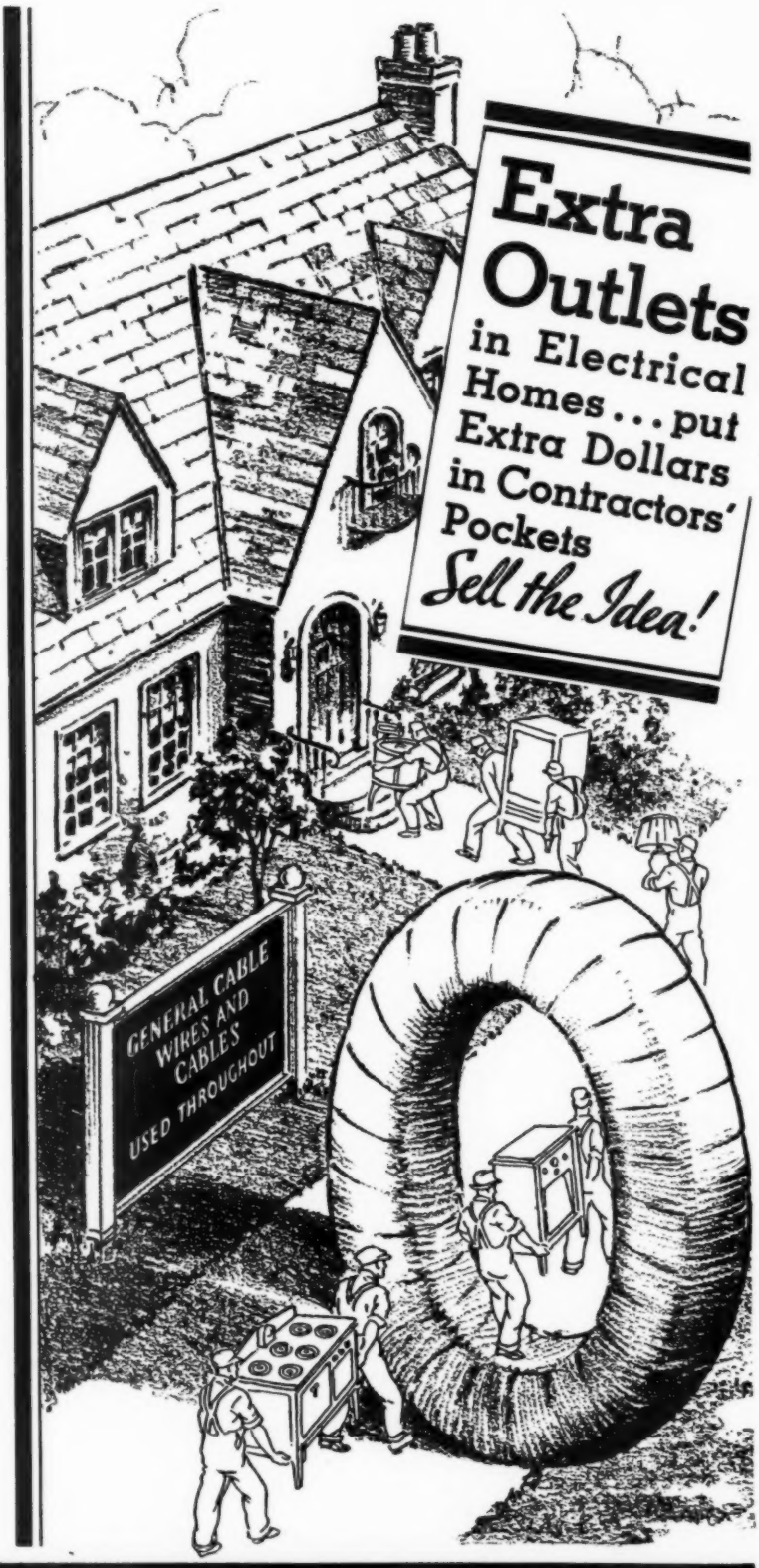
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VOLUME 33
NUMBER 6

electrical contracting

WITH WHICH IS CONSOLIDATED ELECTRICAL RECORD
S. B. WILLIAMS, EDITOR AND GENERAL MANAGER

PUBLISHED MONTHLY
BY
ELECTRICAL TRADE PUBLISHING COMPANY
HOWARD EHRLICH, PRESIDENT

CHICAGO
520 NORTH MICHIGAN AVE.
WHITEHALL 7900

NEW YORK
330 WEST 42ND ST.
MED. 3-0700

CLEVELAND
GUARDIAN BLDG.
MAIN 3981

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The Modern Home

THIS issue is devoted to the electrification of the modern home. Already the residential construction market has started to come back, but the new residence is not the same as it was before the depression. Changes in our mode of living, a changed outlook on life, are finding expression in the modern home. New comforts and conveniences are changing home design.

Have not these affected the electrical work?

A STUDY of the articles in this issue will convince one that the modern home requires a much more carefully laid out wiring job than the new homes of a few years ago.

The heating and air-conditioning systems together with the temperature and humidity control are new and involve a lot of work.

The tendency to build in many electrical appliances is growing and calls for well-planned wiring.

The lighting is given more consideration. In fact, the past practice was to leave the actual lighting to the last. Now much of it is built-in and almost all of it is going to be thought of in the beginning in order to harmonize the design.

The connected load of a modern residence will be considerably greater than that of a predepression residence of comparable size and cost. In fact so great has been the change in the past five years that one is led to expect more.

INADEQUATE wiring has been blamed for some of the sales inertia of some of our major electrical appliances. Are we to continue to handicap the future or shall we, as an industry, start afresh with the reviving residential construction and make sure that the new homes have adequate wiring, not only for today's needs but with some provision for tomorrow?

The contractor can and will do much to promote adequacy but he cannot afford to do the job alone. Competition does not leave enough margin to pioneer.

The public is buying a modern home wants the complete comfort now available. This public is willing to be sold. A demand can be created but it must be at the expense of those who will gain. The contractor cannot be expected to do it alone.

The public utility, the wiring device manufacturer, the appliance manufacturer —all whose market is tied up with adequate wiring should find some way to create a public demand for the complete electrical job.

For one thing the electrical industry should have an electrical home at the Century of Progress—a complete home to create a demand for adequate wiring. Other interests have homes at the Fair, why not the electrical?

Local leagues should be given more money to contact architects and builders, some local electrical homes with more attention to the wiring and less to the furnishings, and some advertising would all help to create demand.

This new home building market is far too important to the electrical industry as a whole to let it expand without attention. It needs cooperative effort.

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✓Check up

on these 1934 business builders

✓Every needed light or switch that's *not* there—every convenience outlet that's inconveniently *absent*—every bit of obsolete electrical work in the homes in your vicinity is a *missed* opportunity. It's a missed opportunity to open up profitable remodelling business.

Clever contractors are finding ways to approach customers—get permission to check over electrical work. Then translate your check-up into business. Do it by selling the home owner on the convenience he is missing. *Show him that he can buy electrical convenience today at prices lower than they may ever be again...*

The question arises—what points should be checked up? This depends largely on the conditions—and on the imagination of the contractor. Here are a few suggestions:

• • •

✓***The Attic.*** Start with the attic. Most attics are too dark and gloomy. A ceiling lighting fixture, operated by a switch at the foot of the stairs, makes the attic a "part of the house." In summer, an attic ventilating fan will help keep the whole house cool. Check up here.

✓***Bedrooms.*** Convenience outlets should be provided for the electric clock, lamps, or radio with extra outlets every 6 feet. Also ceiling fixture for general lighting with wall switches at the door and near the bed. An interesting convenience is a wired vanity with boudoir lamps and outlet for curling iron.

✓***Bathroom.*** Every bathroom should have "shaving lights"—one on each side of the mirror. Appliance outlets 3 or 4 feet from the floor and as far from the tub as possible. A ceiling fixture—preferably of the Sunlamp type. Perhaps, too, a built-in electric air heater.

✓***Dining room.*** Check dining rooms for ceiling fixture with wall switch—bracket lights to lend a cheerful, decorative look—convenience outlets for table appliances, vacuum cleaner.

✓***Living room.*** See that living rooms or libraries are amply supplied with lights—and with *plenty* of convenience outlets. Space them about six feet apart.

✓***Halls and closets.*** Lights and convenience outlets can often be installed to great advantage here. A closet light is a modern necessity—and may be operated with an automatic switch. Check here.

✓***Kitchen.*** No part of the home is becoming more completely electrified than the modern kitchen. Check lighting—a centrally located, properly designed ceiling fixture should be installed. Also ample outlets for the kitchen's many electrical appliances. And don't forget a window or built-in ventilating fan.

✓***Garage, entrances.*** The garage should have ceiling fixture lighting—also a trouble light with a long cord. Convenience outlets. A yard light controlled by three-way switch in garage and house is a distinct convenience. Bracket lights outside the front entrance make a home more attractive.

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VOLUME 33
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APRIL
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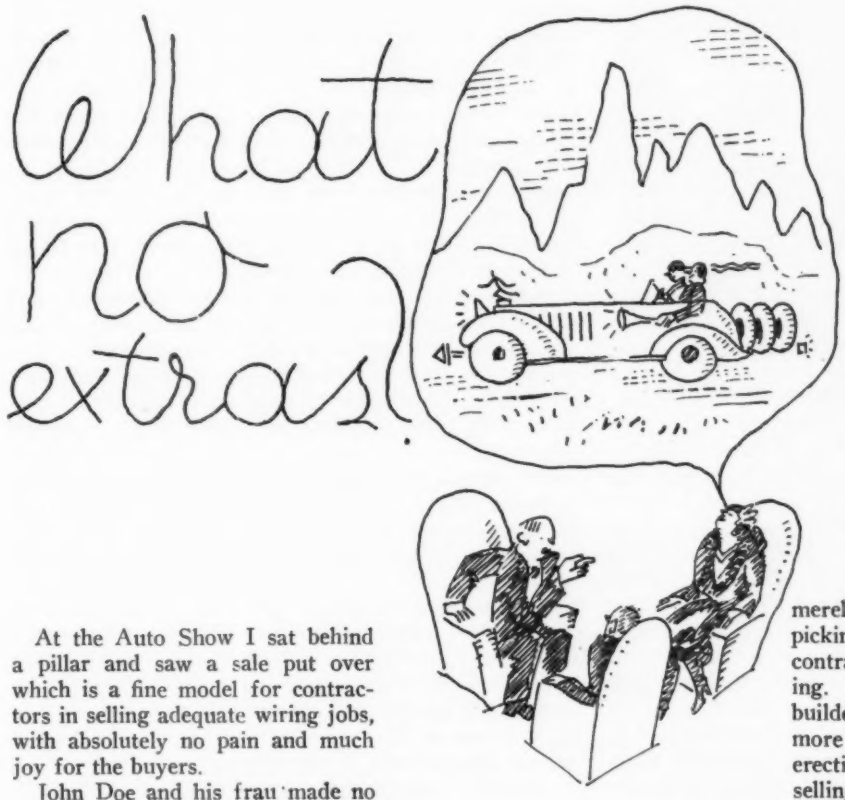

At the Auto Show I sat behind a pillar and saw a sale put over which is a fine model for contractors in selling adequate wiring jobs, with absolutely no pain and much joy for the buyers.

John Doe and his frau made no bones about telling the Sentinel Six man what they wanted—a medium-priced, economical job, and positively no extras! That sounded kind of icy, but the lad went into his dance without batting an eye, and I wouldn't have missed it for a Post Office job.

The sale took about 40 minutes, and not for a second of that time were they in the sales room—mentally. Instead, he kept 'em out on the highway, up in the hills, pulling away from the common herd at a crossing, coming out of the garage on a zero morning, and listening to the ohs and ahs of their friends out at the Country Club. It was so beautiful I felt like a kid reading the descriptions in a bicycle catalog.

But what put the Underwriters' Label on it for me was this. That fellow actually took the Does to the cleaners for everything there was in additions—safety glass all over, spotlight, trunk, oil-drain, etc., without ever using the word "extra." No, sir, those were not cold, shiny, mechanical items he was selling, but comfort, economy, safety, prestige and peace of mind, and the way he wove 'em in with the standard equipment, you'd never dream they were luxuries. And will that couple wake up and kick themselves for spending so much more than they intended? They will not! On the contrary, when they buy their next car, they will be "extra-minded" without knowing it, and the salesman can write soup to nuts across the order without a veto.

A similar opportunity, to sell what is necessary rather than merely what is specified, is ripe for picking by the aggressive electrical contractor today, in all classes of wiring. For instance, a contractor told a builder that, if he would spend $500 more for wiring in a fine home he was erecting, he could add $1000 to the selling price, and make a profit of 100 per cent. The builder took a chance, and nearly passed out with joy when he asked and received, not $1000, but $2000 more for the house, by using the electrical installation as a lever.

Most contractors want to sell adequate wiring, and know how to do it. But, between the scarcity of building and the tightness of buyers caused by conditions, we have backslid into the old habit of asking only for an installation which won't scare the prospect. Now, however, new work is coming back, business is rising toward a sane normal level, and people are loosening up rapidly. Therefore, we can go out and sell the public real jobs in place of minimums, on the basis of increased future value and satisfaction.

by John WISE

Give 'em the works—they'll thank you later on.

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Trends in Modern House Design

By GEORGE FRED KECK, Architect

Mr. Keck is one of the leading students of the modern home in the architectural profession. He designed the House of Tomorrow at the Century of Progress which was inspected last summer by 800,000 people. In this article Mr. Keck translates for the electrical man some of the trends in modern home design which will affect the electrical installation.

—Editor

WE are living in a period of change; we are reorganizing our way of living, of doing business, of being governed. Change usually comes during periods of hard times or depression. When times are good and almost everyone is prosperous, we find it difficult to upset our way of life, in fact, to do so is to be frowned upon by our friends.

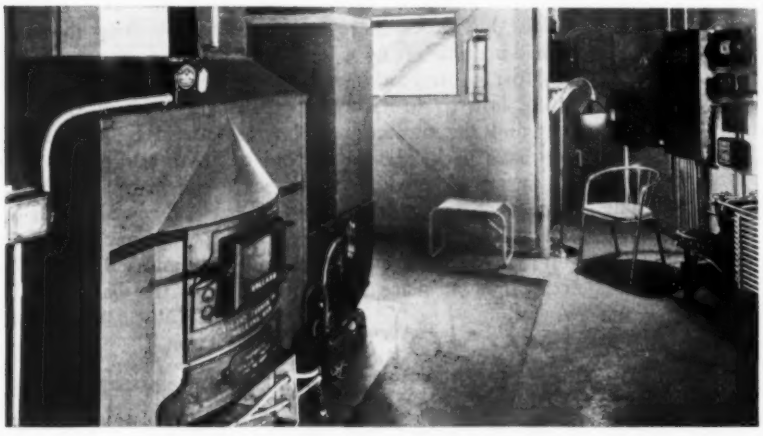
Probably the most important single factor that is soon to influence us and which is giving those who are governing us no little concern is the use to be made of the new leisure brought about by shorter working hours at office and factory. National recovery codes of all types frown upon overtime work, and the actual working hours per week are as low as circumstances and industrial employers will permit; there is no question that the number of working hours per week will be shortened rather than lengthened in the near future.

All of these elements have had a profound effect upon our family life and, therefore, upon the architecture of our homes. The depression has had a tremendously sobering influence and has accentuated home life. How is this finding expression in the design of modern homes and how does it affect the electrical installation?

For some years past architects have included recreation rooms in their residences. Often the recreation rooms contained bars, especially during the prohibition era when drinking was done behind closed doors. But bars were only one of several reasons for basement recreation rooms. The unoccupied section of an unfinished basement was remodeled into a usable room where children and adults could play such games as might be impracticable in the living room. Years ago every house had a living room and a parlor. The living room was always used more or less as a recreation room is today. The parlor was left for more formal entertainment. So today, now that people are again using their houses for the entertainment of friends, we find the recreation room taking the place of the old living room and the living room functioning more or less as the parlor once did.

But today's recreation room is partly underground and must be artificially lighted, and that rather well because of the type of amusements the room is used for. In many cases limited ceiling heights in remodeled basements require the use of recessed panel lighting between joists with flush frosted glass faces. Such treatment gives the room a modern touch nowadays much desired. Where bars are installed trick hidden lights are often used, especially on back bars. Mechanical mixers and refrigeration are also a necessary adjunct to a well-planned bar. There must be plenty of convenience outlets in the recreation room for bridge lamps and for the use of Junior's electrical toys. Electrical cigar and cigarette lighters must abound now that the entire family smokes, and this item brings in its wake ventilating fans of either the unit type or circulating type. Proper radio outlets with grounds and aerials must be installed as an integral part of the house construction, in fact, all of the important rooms should be wired for radio.

Another broad tendency in house design today is to attach the garage to the house. The drive should be near the main entrance to the house and should be well lighted. If possible, a hallway from the garage should enter the reception hall of the house. The garage itself should house, at least, two cars and should have clean painted walls and ceiling and should be lighted as carefully and well as the reception hall. Needless to say the attached garage is heated and becomes an additional room to the house. For the owner who is mechanically inclined a repair shop as a part of or next to



The heater room of the modern home is a small electrical installation in itself.

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the garage is highly desirable. Given plenty of leisure as he will have under the new deal, the owner will spend much of his time repairing and tinkering with his car. The repair and tool room should be equipped with a motor, a buffer and battery charger arranged properly on a work bench.

Two reasons, one the development of manual training in high schools, and another, the forced leisure of the last few years, have made working in wood very popular. Manufacturers of low cost wood-working machines such as band saws, circular saws, lathes, joiners and work benches have had a tremendous boom in business since the depression. These tools have generally found themselves housed in spare rooms or basements. It is safe to predict that many of the new homes to be built will have a separate room for such tools. Motors for most of the machines run up to ½ hp. Properly located outlets and a power circuit are, of course, required and proper lighting not only for seeing but to reduce accident hazards is absolutely essential.

HEATING equipment for the home is also undergoing a change which should interest the electrical contractor. Circulating forced air, "conditioned"—that is, cleaned, heated, humidified, and cooled or de-humidified, is rapidly supplanting hot water and vapor steam heat. A motor is required for the fan, and a motor for the oil burner, or stoker. Connections are required for automatic electrical control both for the thermostat and humidistat. A further refinement is zone control, a hookup of several thermostats and humidistats for temperature control of individual rooms, which, of course, requires a more complicated electrical hookup. When an entire heating system is so dependent upon electricity for heat, it is wise in some parts of the country to allow proper storage battery facilities in case of current failure.

Cooling of the home by means of an ice machine is still rather expensive, but its cost will probably come down in the course of the next few years. Because of its high cost air cooling is omitted from many residences recently built that have air-circulating heaters, but provision should be made wherever such heaters are installed for a future ice machine. The cooling coils are easily installed in the circulating system, and wiring is necessary for at least a 10 hp. motor.

For years there has been a gradual increase in the number of electrical devices used throughout the home and there is every reason to believe that such devices will continue to grow in number. A weather eye to the future must be kept for television, which will be with us as soon as the inventors have jumped a few more hurdles. An auxiliary electrical heater in the bath room is no longer a luxury. On the contrary there is a definite saving in fuel during between-seasons weather when a few such heaters are used in different parts of the house, and the main system remains unstarted.

The Century of Progress exhibit at Chicago has popularized a movement that has been rapidly gaining momentum—a movement towards a new architecture in houses vastly different from the types we see everywhere around us. This change in appearance and materials is giving the architect broader opportunities and greater freedom in design. Since his interior isn't

Increased leisure time is bringing into the modern home a work-room with motor driven tools. There should be enough power circuit capacity to provide for future tools.

Colonial his lighting fixtures no longer have to look like imitation candles in imitation of some faded Colonial mansion. He is at liberty to design fixtures or build them into his building properly to flood his rooms with light; he can give his floors 50 watts per square foot if he wants to, and can install a dimmer hand operated to cut this wattage down to exactly the intensity the owner desires. He can use panel lighting, strip lighting, cove lighting, neon tubes with a new freedom. And this new freedom is precisely what we will have. The architects are permitting themselves a way of design to give the house owners the utmost that the newer materials are capable of, just as the modern automobile gives us the utmost in transportation. The automobile of today is based upon the buggy of yesterday, just as the house of today is based upon the house of yesterday, and there the resemblance stops.

AMONG other things the New Deal has brought us out of Washington is the Tennessee Valley Authority. It is well to keep an eye on this development for if it proves a success it will be instituted elsewhere. With a substantial reduction of electrical rates it is most proper to assume a vast increase in the use of electricity, including all of its known uses and uses yet unknown.

Such a change is sure to come in the not too distant future, and any house now being built in which preparation is not being made for such uses will find itself obsolete before it is finished.

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The Public Appeal of Wiring

By J. W. SALADINE
Sales Manager,
The Arrow-Hart & Hegeman Electric Co.,
Hartford, Conn.

While not particularly interested in wiring as such, the home-owner is intensely interested in the functions of wiring. A sales appeal of added convenience can be built around each outlet by describing it in terms of its function

PROBABLY more literary effort, declamation, and conversation have been expended theorizing on the question of whether or not wiring can be merchandised than any other in the electrical business.

The gist of the written and spoken words on the subject is that the contractor is not a merchandiser. I have heard so much about merchandisers and merchandising that I finally decided to go to the dictionary and find out what the words meant. Much to my surprise, I find that Webster lists "merchandising" as trading or bartering in goods, and a "merchandiser" as one who indulges in such practices. I am afraid this is far from what the literary and oratorical experts really mean or, for that matter, what we need in this business. What we are really all interested in is getting more and better wiring installed. By using the word "merchandising" in connection with the accomplishing of this purpose, I believe we mean to sell wiring by appealing to the imagination of the customer—by painting a visual and word picture of its desirability and convenience so that the customer is eager for it at any reasonable cost.

I most assuredly do not claim to be an expert on all phases of wiring, or even the selling thereof, but I have been testing the possible market for wiring devices, and believe that in them lies the basis for the "merchandising" of wiring. I am convinced that they are the leaders to use in doing a creative selling job on wiring installations, because after all, they are the only part of the wiring job the consumer sees and uses. They are, therefore, the part of your sale around which to build your picture of desirability, which your customer buys. Furthermore, a story can be built around them, whether the project involved is one of a new building or an existing structure to be equipped with modern electrical convenience.

What is this story that can be built around wiring devices which paints such a picture that customers will, so to speak, cry for it? History has proven in many

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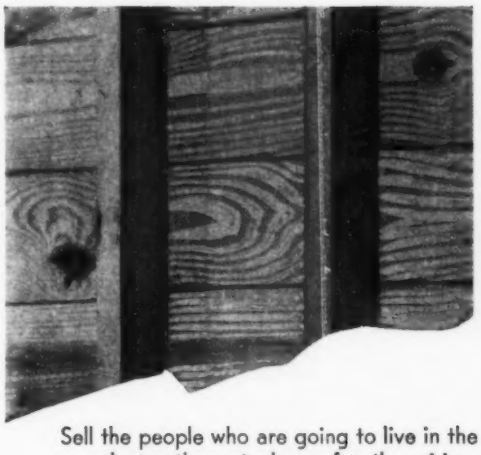

Sell the people who are going to live in the new home the actual use for the wiring.

industries that you cannot sell the consumer through emphasis on mechanics and mechanical features, but that a desire for merchandise, whether it be automobiles, wiring devices, or anything else, must be built up through functional appeal. I mention automobiles because in no industry has the change of method of selling been so rapid or so successful as in that leading industrial field. You and I can well remember that when interested in the purchase of an automobile, we were shown engines, axles, gears, etc. Now the clever automobile salesman rarely lifts the hood to make a sale.

Appearance, price and pleasure of ownership, ease and economy of transportation are sold. For example, there is great emphasis this year on "knee action" and similar devices to accomplish the same purpose. When selling this advance in the transportation art, neither the salesman nor the advertising stress the mechanical features, but emphasizes the additional comfort and ease that can be derived. It may be a far cry from the motor car field to selling prosaic wiring devices, but perhaps aren't we ourselves responsible for them being commonplace in that we do not point out the pleasure, convenience, and ease of living they can bring about for the purchaser.

Rather than generalize any more, let's get down to brass tacks. In putting across our wiring story, I believe that nomenclature plays an important part. The purchasing public today have been sold by appeal to desirability, pleasure, or convenience—as well as automobiles—radio sets, electric refrigerators, electric clocks, and, to some extent, other electric appliances.

Merchandising Names

1. Keyhole Light

Momentary contact switch at front door to operate outside light.

2. Outdoor Christmas Lighting Outlet

Can be installed on side of house or in lawn. Used for decorative lighting at Christmas and can supply light for sports or parties.

3. Radio Outlet

This has energy, ground and aerial connections and should be used in living room, every bedroom and in recreation room.

4. Refrigerator Outlet

Wired with special branch circuit.

5. Range Outlet

Even if no range is contemplated at moment, it costs so much less than it will later if range is installed.

6. Clock Outlet

Kitchen, living room, bedrooms.

7. Fan Outlet

This is outlet and hanger combined. It simplifies the use of fans in the summer time.

8. Bottle Warmer Outlet

This is a duplex outlet in the bathroom and may also be used for curling iron, electric razor or blade sharpener, sun-lamp or portable heater.

9. Vacuum Cleaner Outlet

An outlet in the hall will make it possible for a cleaner on a long cord to be used in both dining room, living room and stairs without reconnecting.

10. Ironing Outlet

Beside the ironing board in such a way as not to drag across board.

11. Mixer Outlet

In the kitchen above the work shelf where mixer is used. This outlet is also used for toaster, waffle-iron or other small kitchen appliances.

12. Christmas Tree Outlet

There is generally one corner where the tree will be placed. A nearby outlet is welcome at the time.

13. Current Savers

These are the switch pilots for cellar light, ironing board, garage lights, closets, attic and any other place where the current is apt to be left on and forgotten.

14. Laundry Outlet

In the basement, to plug-in washer and ironer.

15. Portable Lamp Circuit

This is a circuit of hot and switched outlets. It permits all lamps to be turned on and off at same switch yet permits use of vacuum cleaner or single lamp in day time without having to turn all others off.

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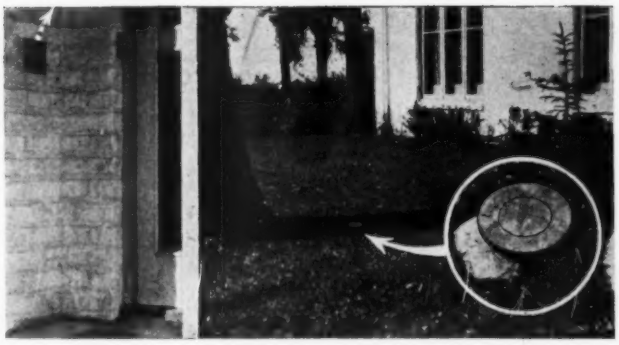
Even now we are, slowly but surely, doing a better merchandising job on electric cooking and modern lighting. All these devices have what is commonly known as consumer appeal—outlets and switches, as such, never can be sold unless that consumer appeal is created. When you mention outlets or plugs to the average person, they will admit that they are nice enough to have, but there their interest dies. However, if they are given a name which immediately conjures up to the consumer mind a picture of desirability or a particular use for that outlet, interest is aroused. I believe therefore, that radio outlets for radios, clock outlets for clocks, range outlets for electric ranges, Christmas tree lighting outlets for holiday lighting, curling iron outlets, and other devices for specific purposes which mean something to the average user, can be sold.



The trade name is a "momentatry contact switch" (left) but what the public buys is a keyhole light.
(Right) You might install a marine outlet but the people who live in this house are going to use it for outdoor Christmas lighting.

First of all, our picture must be dressed up to attract, and then after attraction the desire must be created on a reasonable price basis. With the buyer interested through a tie-up with some well known and wanted device, the story can be carried further to the need for a pilot light with a switch at the top of the cellar stairs, an outlet in the garage, an outlet and switch combination in the bathroom, a keyhole light for the front door (don't call it a momentary contact switch—it won't register), burglar lights, night light outlets for bedrooms, and many others.

I have often thought that one of the most overlooked wiring device conveniences was the two-circuit receptacle for living room lighting. Most living rooms today are lighted by table and portable lamps. These, plugged into one circuit of a two-circuit receptable and controlled by a switch at the living room door or doors, perform an electric service which is really appreciated by those that have it. The other outlet of each receptacle, of course, is always alive for any appliance such as a vacuum cleaner, or for any individual lamp used as a night light or when the room is not in use. However, calling this device a two-circuit receptacle, the public never in the world will be sold. As they are particularly adaptable to serving portable lamps, I suggest that they be called portable lamp circuits. I would even go so far as calling three-way switches dual location switches, or upstairs-downstairs switches, which would register their function on the public mind, whereas three-way means nothing to the layman.

As concrete example of neglected fields, I can point without pride to my own house although it is only three years old. I recently became the proud owner of a razor blade sharpener. There has been a regular fad and justly so for these little electrical devices helpful in accomplishing one of the most tedious of daily chores. My enthusiasm for it, however, is slightly dampened each morning when I find for lack of an outlet in the bathroom, I have to carry the device into the bedroom to use it. Feeling perhaps that I had an exceptionally poor electrical installation, I made it a hobby to check other bathroom installations as I see them and find that only in 25 per cent of them is an outlet available which would solve my problem or for curling irons, room heaters, baby-bottle warmers, or other device.

Also, Christmas is not so far behind me but that I well remember the Rube Goldberg wiring arrangement which I used to secure a holiday season lighting effect of which I was justly proud. An outdoor receptacle, which I swear will be installed before another year rolls around, would have eliminated the march of messy wires through windows and over front porch which I had to suffer with this year.

The easiest time, of course, to sell the customer is when he is building the new home. He wants everything as nearly right, as nearly convenient as possible. It is necessary, however, to arouse the desire and this, it seems to me, can be done with less effort by suggesting a use rather than trying to sell some bakelite, copper, brass, screws, spring action, etc.

Where a demand exists, where greater convenience can be offered, around any device can be built a brief story that will register an immediate appeal to the purchaser, provided and only provided it is named so that the purchaser can immediately understand its function. An electric clock outlet that permits the installation of an electric clock flush with the wall with all wiring concealed so that there are no messy wires to detract from the appearance of a charming room, can with a name and a few phrases, be made to register on the consumer's mind as desirable. The radio outlet has a similar appeal in providing for the installation of power, antenna, and ground with a minimum of messy surface wiring to clutter a den or living room. These devices perform a function. Their desirability is there, but we never, as an industry, have pointed it out or pictured it clearly to the home owner.

The wiring job is the fundamental basis of the use of electricity as far as the consumer is concerned. The electrical industry has spent thousands upon thousands of dollars in selling the public labor saving appliances and entertainment devices, but have never devoted any money or effort to dressing up with sales appeal the functional necessity of a wiring job of completeness and convenience. The demand unquestionably exists. A story can be built up with which to contact and sell that demand. The few items mentioned herein are only suggestions which experience and sales volume achieved without concerted effort have proven that wiring through the medium of wiring devices, properly pictured and presented, can be "merchandised."

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Check List

When going on the job with the prospect be sure each item is covered in the plans or brought to the customer's attention. Check each item when approved. Use a cross when the item is not wanted.

Check List	√
BED ROOM	
Clock Outlet	
Closet Light	
Night Light	
Master Switch Control	
Radio Switch	
Radio Outlet	
Fan Outlet	
Telephone Outlet	
Vacuum Cleaner Outlet	
Bed Reading Light Outlet	
Ceiling Light Outlet	
Ceiling Light Switch	
Mirror Lights Outlet	
Electric Train Outlet (Child's Room)	
Sun-lamp Outlets	
BATH ROOM	
Light Outlet each side of mirror	
Ceiling Light (large room)	
Heater, built-in	
Bottle Warmer, Electric Razor, Blade Sharpener, Curling Iron or Sun-lamp Outlet	
Wall Switch	
HALLWAYS	
Door Chimes	
Ceiling Light	
Upstairs-downstairs Switch	
Vacuum Cleaner Outlet	
Closet Light	
Telephone Outlet	
ATTIC	
Ceiling Lights	
Trunk Light Outlet (length of heavy duty cord with lamp and guard)	
Switch with current saver pilot	
Radio Antenna	
Ventilating Fan	

Check List	√
PORCH	
Ceiling Light	
Indoor Switch	
Reading and Bridge Lamp Outlets	
OUTDOORS	
Front Door	
Lights	
House Number	
Inside Switch Each	
Back and Side Doors	
Entrance Light	
Inside Switch	
Christmas Outdoor Lighting Outlet	
Inside Switch	
Protective Lighting	
Garden Lighting or Sports Lighting Outlet	
GARAGE	
Ceiling Light over hood each car	
Trouble Lamp and Vacuum Cleaner Outlet	
Dual Location Switch Control at each entrance	
Outdoor Light	
KITCHEN	
Garage Light Switch	
Range Outlet	
Refrigerator Outlet	
Ironing Board Outlet	
Mixer, Toaster and Kitchen Appliance Outlet	
Dish-washer Outlet	
Lighting	
General	
Sink	
Cooking	
Refrigerator	
Cupboard	
Ventilator (built-in)	
Clock Outlet	
Flush Signals	
Telephone Outlet	

Check List	√
DINING ROOM	
Lighting	
Ceiling	
Cove	
Brackets	
Table Appliance Outlets	
Two Location Switch at each door	
Maid Signal	
LIVING ROOM	
Radio Outlet	
Portable Lamp Circuits (with hot and switched outlets)	
Lighting, general	
Ceiling	
Bracket	
Cove	
Two Location Switches at each door	
Clock Outlet	
Christmas Tree Outlet	
Book-case Outlets	
Mantle Outlets	
PANTRY	
Mixer Outlet	
Ceiling Light	
Light Over Shelf	
Switch	
CELLAR	
Lighting	
Over tubs	
Near furnace	
Over work-bench	
Sports room	
Storage room	
Switches	
Light control each room beside door	
Cellar pilot	
Washing Machine Outlet	
Ironer Outlet	
Work Shop Power Circuit and Outlets	
Radio Ground	
Extra service capacity	

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The Industry's Standards for

Adequate House Wiring

By ARTHUR L. ABBOTT

The Standards of Wiring Adequacy for Residences, approved by every national association in the electrical industry, first set up standard loads for lighting, and for portable and fixed appliances. Based upon these loads formulae are given for computing the required number of lighting and appliance branch circuits and the required service capacity. These are detailed below while on the opposite page is given in tabular form by rooms a summary of outlet recommendations.

Lighting Circuits

ONE 15-amp. branch circuit is to be provided per 500 sq. ft. of floor area. The area is computed from the outside dimensions of the house and does not include open porches or unfinished spaces in the basement or attic. All circuit wires are to be No. 12 and the outlets supplied are to be divided equally between the circuits, or as nearly equally as possible. These circuits are always in addition to the appliance circuits called for by the Standards.

Appliance Circuits

At least two appliance circuits are to be installed in every house. They are to supply all convenience outlets in the dining room, breakfast room, kitchen, pantry and laundry and are to be confined to these spaces and these outlets. It is recommended that both circuits be run to each of the rooms named and that the outlets in each room be equally divided between the two circuits.

The National Electrical Code requires wire not smaller than No. 12 for appliance circuits and permits 20-amp. overcurrent protection, thus the combined capacity of the two circuits is 40 amp. at 115 volts or 4,600 watts. It is reasonably certain that this capacity will be found ample in any residence up to 12 or 14 rooms in size. Additional appliance circuits may be called for to meet special conditions found in houses of the class costing $50,000 or more.

Individual Appliance Circuits

An individual branch circuit is required by the N. E. C. for the supply of each appliance rated at more than 15 amp. This means 15 amp. at 115 volts, since an appliance circuit feeding two or more convenience outlets or applications is limited to a maximum of 125 volts. It would sometimes be practicable to supply two 1,000-watt appliances by one appliance circuit, but even then voltage drop must be considered, and as a general rule it is preferable to provide an individual circuit for each appliance rated at 1,000 watts or more.

Branch circuits should be installed for all of the fixed appliances listed below in the outline of the method for computing the service capacity, or if some of these circuits must be omitted from the original installation, the work should be left in such condition that any of the omitted circuits can be added later at a minimum of expense.

Service

The capacity of the service is to be computed in two steps. First, the demand in watts is determined for the lighting and small appliance load, and second, the demand for the larger appliances is computed. The sum of these two demands is the service capacity that should be provided.

1. **Lighting and Small Appliances.** Allow 2 watts per sq. ft. for the first 2,000 sq. ft. of floor area, plus 1 watt per sq. ft. for the area in excess of 2,000 sq. ft., plus 1,000 watts.

Example: The total floor area of a given house, computed as previously explained, is 2,800 sq. ft. The service capacity to be allowed for lighting and small appliances is:

2,000 sq. ft. at 2 watts per sq. ft.	4,000 watts
800 sq. ft. at 1 watt per sq. ft.	800
Fixed allowance	1,000
Total demand for this part of load	5,800 watts

2. **Large Appliances.** The appliances to be provided for should include, as a minimum, a range, a water heater, an air heater in each bathroom, an oil- or gas-burning heating plant or automatic stoker, and at least 1,500 watts spare capacity. The actual rating to be assigned to each appliance must be determined locally, as these ratings will depend to a considerable extent upon the practice recommended by the local power company. The ratings given below may be taken as fairly typical.

Example: The large appliance load to be supplied is as follows:

Range	8,500 watts
Water heater	3,000
2 Air heaters	3,000
Oil burner	1,000
Spare capacity	1,500
Total	17,000 watts

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Summary of Outlet Recommendations

Space	Outlets: Ceiling	Outlets: Bracket	Outlets: Convenience	Switch Control
Front entrance. (Depends upon architectural arrangement)	1 OR	2 or 1		1 inside
For house number		1		1 inside
For decorative lighting			1	1 inside
Side and rear entrance	1 OR	1		1 inside
Covered porch—Per 100 sq. ft. floor area	1 OR	1		1 inside
Porch, terrace or patio—Per 15 ft. of wall space on house side			1	1 inside
Hall, passage, stairway—At head and foot of stairway	1 OR	1		2 3-w. or 1 3-w. and 1 4-w.
Additional (if required) for each 15 ft. length of hall	1 OR	1		1 or 2*
For each 12 ft. length of hall			1	
Living room, bedroom, reception hall, library, den, sun room, children's play room, recreation room, enclosed porch, etc.	1			1*
Or (see Standards)	2			2*
For decorative purposes		†		1 or more*
Per 12 ft. of wall space (See Standards)			1	1 or more
Living room, master bedroom and elsewhere as desired—provide radio outlet.				
Dining room, breakfast room or breakfast nook	1			1*
For decorative purposes		†		1*
Under 100 sq. ft			1	
Over 100 sq. ft			2 or more	
Additional, if necessary, in each space for buffet, serving table, etc.				
Kitchen, pantry, each	1			1*
At each work area, as range, sink and table	1 OR	1		1 or more
At table and each other work area			1	
For connection of refrigerator, fan, dish washer, clock, etc., each			1	

Space	Outlets: Ceiling	Outlets: Bracket	Outlets: Convenience	Switch Control
Bathroom	1		1	1
In separate shower compartment	1			1
Each side of mirror		1		1
Lavatory—each side of mirror.		1		1
Laundry—over tubs	1			
Over ironer location or over ironing board, or both	1			
Controlling 1 or more of above				1
Over washer (pendent)			1	
As needed for other appliances.			1 or more	
Basement—				
Each unfinished space	1			
At foot of stairway	1			1 at head of stairs
In front of furnace	1			1
For motor-driven tools			1 or more	
Attic—unfinished spaces				
Each separate space	1			
At head of stairway	1			1 at foot of stairs, or 2 3-w.
In suitable location			At least 1	
Closets 3 ft. or more deep or having 10 sq. ft. or more floor area	1 OR	1		1 (or pull-chain socket)
Garage—				
Over hood of each car	1			1
Between each 2 cars, at rear	1			
On exterior		1		2 3-w.
On rear wall, for each car			1	
Protective lighting—				
At rear outside corners, immediately under eaves (See Standards.)		2 or more		2 3-w.

*3-way, or 3-way and 4-way, control should be provided at each regularly used entrance to every room or hall where such entrances are 12 ft. or more apart.

†For decorative purposes as many bracket lighting units can be installed as may be desired.

It is generally agreed that for any such load as the foregoing, a demand factor of considerably less than 100 percent may be applied with entire safety. Until suitable demand factors have been established after an investigation of peak loads in actual installations, it has been suggested that the following very conservative rule be used: Where the installation consists of a range, water heater and at least two other fixed appliances with a combined rating of 3,000 watts or more, a demand factor of 70 percent may be applied to the total connected load of fixed appliances.

70 per cent of 17,000 watts is 11,900 watts. Adding to this 5,800 watts, the required capacity for lighting and small appliances, the total service capacity required is 17,700 watts, equivalent to 77 amp. at 230 volts. A 100-amp. service switch should therefore be installed and the service conductors should be three No. 2.

Outlets

The outlets and switch control cannot be laid out according to any fixed rules, for each house is an individual problem. The Standards discuss fully the desirable arrangement for each space in the house and should be followed so far as financial considerations will permit. The basic outlet recommendations are shown in the following table. It is impossible, however, to include all of the recommendations in any practical and usable table and in each case the appropriate paragraph of the Standards should be consulted in order that all recommendations may be noted and due weight given to each.

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Entrance
A light on either side of the doorway—when architecturally possible—frames the entrance and creates an impression of hospitality. The illuminated house number is a convenience that should be had by every home owner.

Modern Home Lighting

By DEAN M. WARREN
General Electric Company, Nela Park, Cleveland, Ohio

Nothing in the home has changed so much perhaps as the lighting. Not only is design different but the approach of the lighting industry to this market is one of vision and eye conservation.

Living Room
In the living room there should be an adequacy of convenience outlets to permit the use of floor or table lamps at every location where visual operations may be performed. A ceiling outlet should be provided even though the lighting unit may not be immediately installed. Until a time when the desired unit can be obtained, one or two totally-indirect floor lamps may be used for those occasions when overhead lighting is desired. Wall brackets, once popularly used to replace center fixtures, are best used only when they are desired for their decorative touch and then only when a balanced arrangement can be obtained. The mantle offers a logical location for an outlet, to which may be connected an electric clock or a lighting unit for picture illumination.

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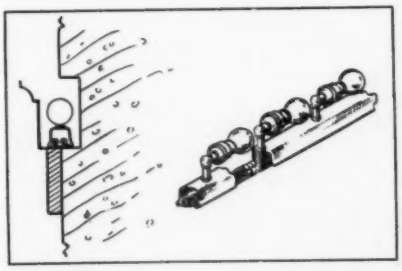
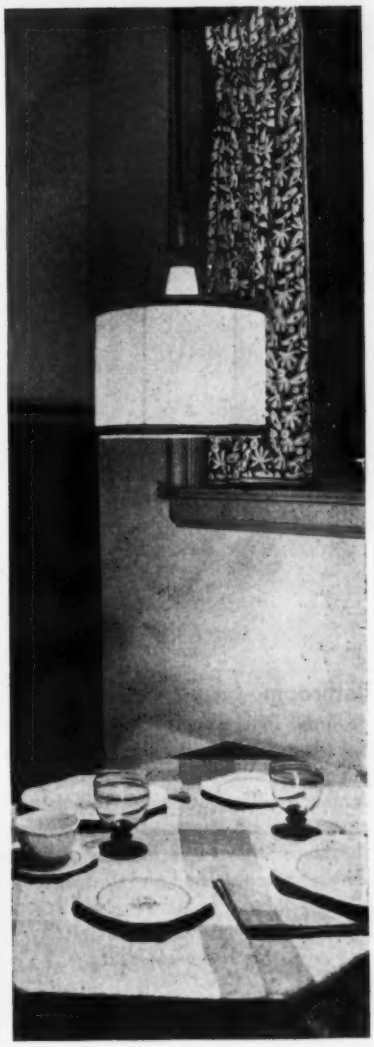


Dining Room

This dining room has a flexible lighting system; direct lighting for utility and cove lighting for the creation of an environmental setting. The latter is particularly effective for those occasions when candlelight is desired. The windows must be at least 1 ft. from the ceiling and must balance; that is windows on either side of the room or on all four sides. The line drawing shows wiring and lamping arrangement in coves.

The major lighting requirement in the dining room is one providing directional light for table illumination. The unit shown in the illustration (left) is of special design and consists of a parabolic reflector equipped with a 100-watt lamp and covered by an etched glass plate for providing diffused directional lighting. This equipment also has an indirect characteristic; four 25-watt lamps being located behind the glass shade, give life to the unit and provide indirect lighting.



Breakfast Room (right)

Many breakfast rooms are really a part of the kitchen, but the regular kitchen unit does not provide satisfactory lighting for this location. The illustration shows one manner of lighting this area. Here the unit is low and centered over the table. This method is satisfactory from a lighting standpoint and in a measure seems to separate this location from the rest of the kitchen. Where the breakfast room is separate, indirect lighting may be satisfactorily used.

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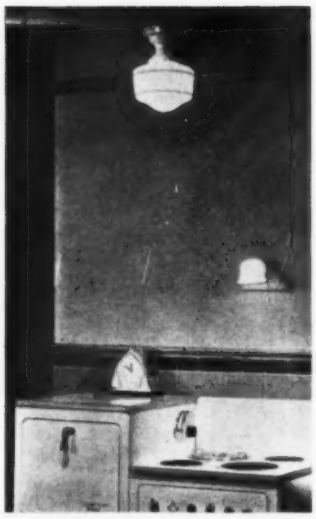
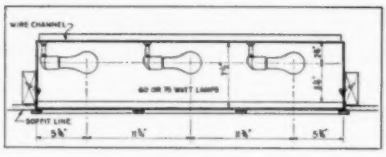


Kitchen

The kitchen should have a flexible lighting system for comfort, ease and efficiency. There should be a center fixture for general illumination supplemented by local units at those locations where a given activity takes place; the stove, the sink, and the work areas. Convenience outlets should be available for the various electrical appliances used in the kitchen. A built-in lighting unit over locations where needed is a suggested innovation and should appeal to the builder who is interested in installing modern conveniences in the home.

Lamping arrangement for built-in lighting unit for use over range, sink or other work area. A face width of at least 10 in. is recommended. An etched aluminum trough is suggested.



Study Room

No room in the home is quite so important from an eye conservation standpoint as the child's study. A semi-indirect ceiling fixture is recommended. Where eyes are used for play or study, supplementary lighting is necessary and this necessitates adequate convenience outlets.

Bathroom

A center fixture may or may not be provided depending upon the size of the bathroom. A light on either side of the mirror and convenience outlets are absolutely essential. An outlet may be provided for a sunlamp. The illustration shows one manner of lighting the shaving mirror. The lighting is obtained from 40-watt tubular lamps enclosed in opal glass cylinders.

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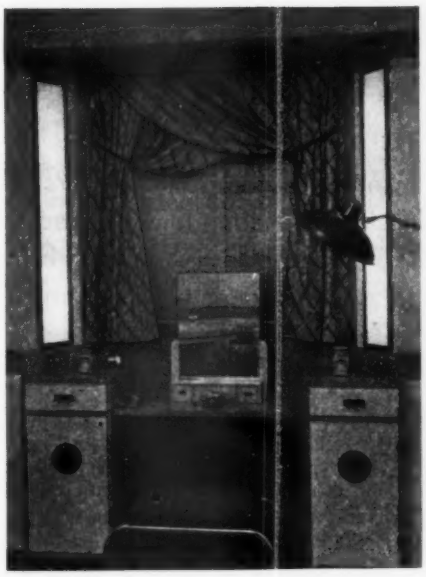
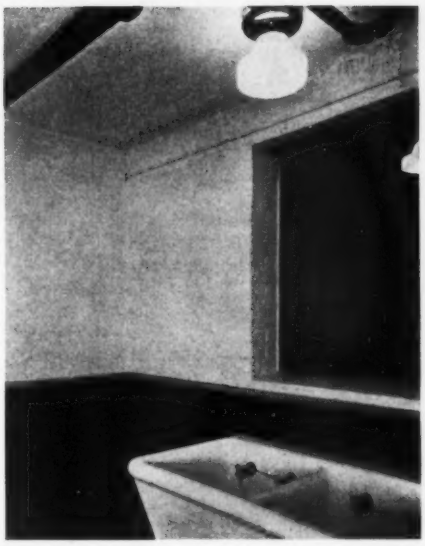


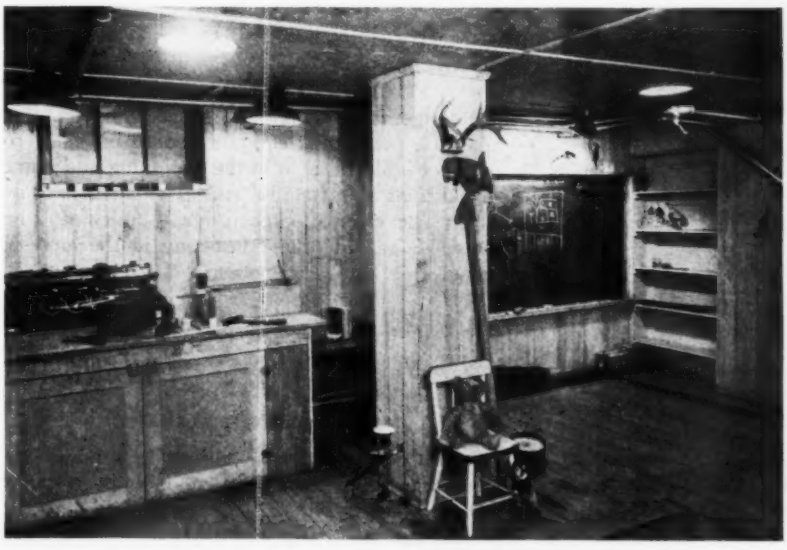
Bedroom

A center fixture is recommended for the bedroom. The illustration shows one of modern design. The dressing table should have a light on either side of the mirror in order to aid milady in the subtle art of makeup. Either built-in lighting units or table lamps are adaptable for the service. The built-in unit, however, is of more modern concept and will undoubtedly appeal to many individuals. The one in the illustration is equipped with two circuits: one having daylight lamps for daytime makeup, the other equipped with regular inside-frosted lamps for night makeup.



Basement

The lighting in this area is strictly utilitarian. Enclosing glass globes located directly over tubs and ironing board will provide the necessary "Seeing Light" for the performance of these operations.



Play Room

The play room and workshop is the scene of a variety of activities and obviously should have flexible lighting to aid the youngsters in the performance of the many visual tasks taking place in the area. A general overhead lighting system is recommended, with supplementary units at those points where needed. The illustrations show one way in which work bench and blackboard may be effectively lighted.

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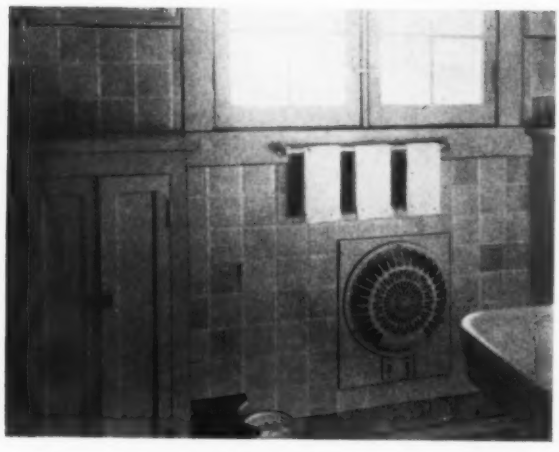
Built-in

Like the automobile the first stage thing "extra," something added to the built. The modern home is bringing trical conveniences built into the home

Electric Kitchen

Kitchen Ventilator



Bathroom Heater

Ventilation

While the most obvious place for a ventilating fan in a home is the kitchen to carry off odors, steam and excess heat, a fan can increase sleeping comfort when placed in the attic to carry off the air in the attic and upper story which had been heated by the sun's rays beating down upon the roof. A ventilator also will be found useful for carrying off smoke fumes from the recreation room.

Heaters

As auxiliary heat for bathrooms an electric heater is a necessity for those who have them. They also will prove most economical when installed in various rooms to provide fall and spring heat when it is needed only for a short time. The saving made by not having to start the house heater will pay for the electric heaters in a couple of years. These heaters have a heavy load and should be provided with a separate branch circuit.

Electric Kitchens

Refrigerators, ranges, dish-washers, etc., are, after all, permanent equipment once installed, so why not build them in in the beginning and make the kitchen as attractive and as efficient as possible. The electric kitchen idea—built into the house—is making rapid headway in the modern home.

Radio

The use of more than one set in a home has accentuated the need for a good built-in radio wiring system with carefully designed aerial, ground and radio outlets.

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Convenience

of electrical convenience was some-
house after it was designed and even
the next and permanent stage—elec-
—made a part of the original design.

Lighting

There is a very definite trend today toward built-in panel lighting as well as ceiling units. The panels may be vertical on the walls or ceiling panels. This is particularly true of kitchens and mirror recesses in bedrooms. Cove lighting is also gaining slowly in popularity.

Signalling

The old-fashioned bell and buzzer is being superceded in the modern home by signalling equipments that are modern in design. Units hidden behind a grating that has been built into the house flush with the wall are more in keeping with the modern home. There are also electric chimes for front door announcements.

Alarms

The increase of kidnapping and the scare of burglary makes a burglar alarm system, if modern, almost a necessity in the modern home. The modern types available are the photo-electric cell type, both visible and invisible ray, and the radio field type. The former protect windows, or treasures, or the crib by giving an alarm if the ray near such places is broken. The latter rings an alarm whenever the radio field about any window or door, so protected, is entered by any foreign object.

Yard Lighting

Built into the lawn or garden is a weather-proof outlet for which a circuit can be taken to supply light for the garden or for sports or for outdoor Christmas lighting. It costs little to install in the beginning but a lot after the lawn is made.

Flush-call Signals

Radio Outlets

Yard Lighting

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electrical contracting

With which is consolidated Electrical Record

S. B. WILLIAMS, Editor

SELFISHNESS HOLDS UP CODE

THE battle of organized manufacturing interests against the Code of Fair Competition for the Electrical Construction Industry, is being fought every inch of the way by industrialists who do not want to have their right to engage in any form of construction limited by any code.

These operators of industrial plants claim that they are operating under their own codes and that to subject their employees to several different trade codes would severely disorganize their labor. On the other hand, it is not difficult to see the real reason for opposition. Under the several manufacturing codes with no skilled labor minimum wage it would be permissible to hire electrical workers for as little as 40 cents an hour. That is considerably less than 75 cents. But it is not only the electrical work. If the electrical code is approved then the industrial plants will find the same restrictions with respect to other construction work. If they were entirely relieved from the operations of the electrical and other construction industry codes it is apparent that they could do their own construction work for considerably less money.

It is this kind of selfishness that is holding up the electrical contractors' code.

Just as there are strong forces opposing this code, however, there are other determined beings who are making every effort to have it approved just because so much of the effectiveness of all of the construction industry divisional codes hinges on this code.

According to the latest reports the code is on General Johnson's desk awaiting his approval. As this is being written anybody's guess is as good as another's as to when the code will be signed. It may be signed before this issue is off the press or it may be weeks away. One thing, however is certain, that despite delays, and disappointments the National Electrical Contractors Association is doing everything possible to hasten this signing of the code, while at the same time making sure that the electrical contractors' interests are not in any material way impaired.

ADMIT THE HAZARD

SOME twenty years ago one of the first jobs the Society for Electrical Development did was to combat the reporting by newspapers of fires as due to electrical causes when no other cause was apparent.

Undoubtedly the newspapers overdid it in reporting electrical fires and perhaps their activities did considerable to delay the progress of electricity. Times have changed, however, in the generation that followed, and it is doubtful if the public can now be scared into using less electricity.

People do not buy fewer automobiles because the tire chain people advertise accidents, or because the insurance people advertise terrible smash-ups. Much of our advertising today is of a "hazard" nature and the result is not to use less of the "hazardous" article, but to spend more in purchasing the thing which will prevent or protect against accident.

With electricity we face the same public and we need not be afraid to point out the dangers of electric service. We all know that electricity is as safe as any power in the world, if not safer, provided . . . Why not tell that to the public and at the same time tell the public what may happen if these safety measures are not observed?

If we tell a straight forward story reinspection should be easy.

PRE-FABRICATED HOUSES

WHERE will the average small house of the future be built, in the factory or at the home-site?

This is a question which is absorbing the attention of a great many people in the building and building supply industry and is one which will have a far-reaching effect upon the house wiring contractor and the electrical wholesaler.

It has been contended for some time that our present method of building a house on the ground is too costly because this method not only cannot take advantage of quantity production savings, but extra costs are imposed by the employment of a number of sub-contractors.

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One of the solutions to this problem that is proposed is pre-fabricated sectional construction.. These sections will come already piped and wired.

Isn't this a problem for the electrical contracting industry to study and make recommendations before it goes too far and perhaps gets away from us?

Can pre-fabricated wiring be permitted under the National Electrical Code and the local municipal ordinances? May not some kind of flush wiring be necessary to meet Code requirements?

Undoubtedly, the pre-fabricated house will provide less work per house for the electrical contractor but it nevertheless has possibilities for the contractor. Since most of the work will be wire pulling and finishing, it is essential that these houses be adequately wired. Such an idea can be sold to the manufacturers.

Also these pre-fabricated houses will be priced to sell in large numbers. The volume should provide a very large amount of work for the electrical contractor.

THE SHORTER WORK-WEEK

WHAT will be the effect of shorter working hours on the electrical contracting industry? It is quite evident that with certain members of Congress attempting to secure legislation for a 30-hour week and with the President and the N. R. A. insisting on lower maximum hours in industry codes that something less than forty hours a week is going to be the new work-week.

Electrical contractors, like other business men, must approach this shorter work-week problem from two directions: First, what is the effect upon construction costs and the operation of a contracting business; and second, what effect will a shorter work-week for all other labor have upon the electrical contractor's business?

The study on the 30-hour week which appeared in the February issue of ELECTRICAL CONTRACTING showed that wiring installation costs would be increased from 5 to 10 percent by reducing the work-day from 8 hours to 6 hours, assuming no change in the hourly wage-rate. If the wage rate is increased, and obviously it must if a 30-hour week is to become permanent, then of course, the figures of increased cost will be greater still.

The increased cost set up by the shorter work-day is not necessarily permanent, at least to the degree indicated. One thing is obvious and that is that the contractor who is a better job manager will find it easier to compete on the 30-hour week, because of the ways in which he will eliminate many of the wastes attendant upon the shorter work-day. In other words, the shorter work period will place a premium upon job management and encourage more careful supervision and work layout.

It is also probable that the shorter work-period will encourage greater coordination of the installation by the different trades on a job and a better coordination of working plans before the work commences in order to reduce job problems.

There is another side to this problem that is equally important to the electrical contractor and that is the effect upon his business of a shorter work-day for all other labor.

A reduction of two hours a day and no work on Saturday is going to bring added leisure to labor. What is labor going to do with this extra time? Will labor employ this extra leisure period in a way that will mean increased business for the electrical contractor?

This, of course, is speculative thinking but the one who thinks first is like the early bird. For instance, will increased leisure time produce increased business for bowling alleys, pool parlors, taverns, beer gardens, etc.? If it does, will it not mean more such places and therefore, a competition for trade? Will not that competition offer the electrical contractor an opportunity to sell better lighting and other electrical conveniences?

Will this added leisure time cause more people to drive into the country thereby increasing the business and number of roadside stands? Is this not an additional market for wiring?

Will not people with more leisure time plan to live further away from the city, thereby creating a new home market? May not the extra leisure time take more people to the seashore, mountains, woods, etc. in the summer month week-ends and will this not make a better market for small lighting plants?

Of course, the above is a kind of thinking-out-loud, but it should be evident that the shorter work-day and work-week will bring a greater market for the electrical contractor. In fact, a committee of the entire electrical industry might well afford the time to make a study of the possibilities in this direction.

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\\\ code chats ///

A MONTHLY DISCUSSION OF WIRING PRACTICE AND QUESTIONS OF INTERPRETATION, PRESENTED WITH A VIEW TOWARD ENCOURAGING A BETTER UNDERSTANDING OF THE NATIONAL ELECTRICAL CODE

CONDUCTED BY F. N. M. SQUIRES
CHIEF INSPECTOR, N. Y. BOARD OF FIRE UNDERWRITERS

BONDING OF GROUND CONDUCTOR RUN IN ARMOR

Rule 907-1 of the 1931 Code required that a grounding conductor run within an armor (conductor cable) be bonded to the armor. I do not find this requirement in the 1933 Code. Have I overlooked it or has the requirement been changed?

This requirement does not appear in the 1933 Code.

It was understood that the requirement for bonding was to prevent a choking effect on high frequency currents (lightning) attempting to pass to ground.

ADDED CIRCUITS IN 10-FT. RUN OF CONDUIT

A condition arises where after a job is completed the owner decides to install ninety 40 watt lamps on three circuits, (footlights on a stage). At present there is a ½-in. conduit containing two No. 14 wires. This conduit is embedded in masonry and runs approximately 10 ft. from the stage panel to below the level of the stage. Could this conduit be used for the three circuits controlling the footlights as well as the circuit which it contains? The footlight wires leave this conduit at a box at the end of the conduit.

Ninety 40 watt lamps divided on three circuits would give a load of approximately 11 amp. per circuit. As two of the circuits would have to be on one side of the 3-wire system, the neutral would have to be ample for 22 amp. which is a No. 10 wire. As the conduit is but 10 ft. long, the inspection department having jurisdiction might give special permission to install three No. 14 and one No. 10 wires in a ½-in. conduit, but otherwise the conduit would have to be ¾ in. Another possibility would be, also with the permission of the inspection bureau, to use the present No. 14 wires for one circuit and then pull in three more No. 14 wires for the other two circuits, taking care to balance the two circuits on the three No. 14 across the 3-wire system. This would mean five No. 14 wires.

FIXTURES TOUCHING PIPES

If a brass fixture touches a water or gas pipe as shown below, would it be against the Code rules, whether the fixture was grounded or not?

The fixture was hung this way to be in center of panelled ceiling. The pipe could not be moved. What could be done to avoid pipe touching the fixture?

The Code does not provide for such a case as stated above. However, if the fixture is not grounded, the water or gas pipe does not effectually ground the fixture and, therefore, the proper thing to do would be to insulate the fixture from the pipe by means of a piece of loom slipped over the pipe.

If the fixture is grounded and the pipe is a water pipe there would be no harm in the metal of the fixture touching the pipe, but it would be better to protect the fixture wires from contact with the pipe and also to protect the fixture from condensed moisture on the water pipe. Again loom would do the trick. If the pipe is for gas then by all means should it be covered with loom.

NON COPPER GROUNDS

908-c. Is anything else ever used for grounding the service wire besides copper?

908-c allows anything else to be used if of equal conductance with a copper wire. It seems that it would be hard to tell what size conduit was equal to the same conductance as a given size wire. How is this done or figured?

A copper clad steel wire or rod is considered non-corrodible, but copper is generally used.

As for the size of conduit to be used to equal the conductance of a copper wire of given size, see the table in 908-k (page 140—1933 Code).

FEEDER NEUTRAL SIZES

How would one calculate from 2011-e the size of the neutral if there were three sets of feeders, No. 8, No. 6, and No. 4, carrying 30, 40 and 60 amp., respectively, per feeder?

Could one, under any circumstances, reduce the size of a neutral in a single feeder circuit or main as per the following: Two No. 3/0 and one No. 2/0 for the neutral? This question comes up for discussion in view of both of the preceding sections allowing a smaller neutral where grouped.

A conductor to serve as a common neutral for three 3-wire system feeders of 30 amp., 40 amp., and 60 amp. each, should have carrying capacity

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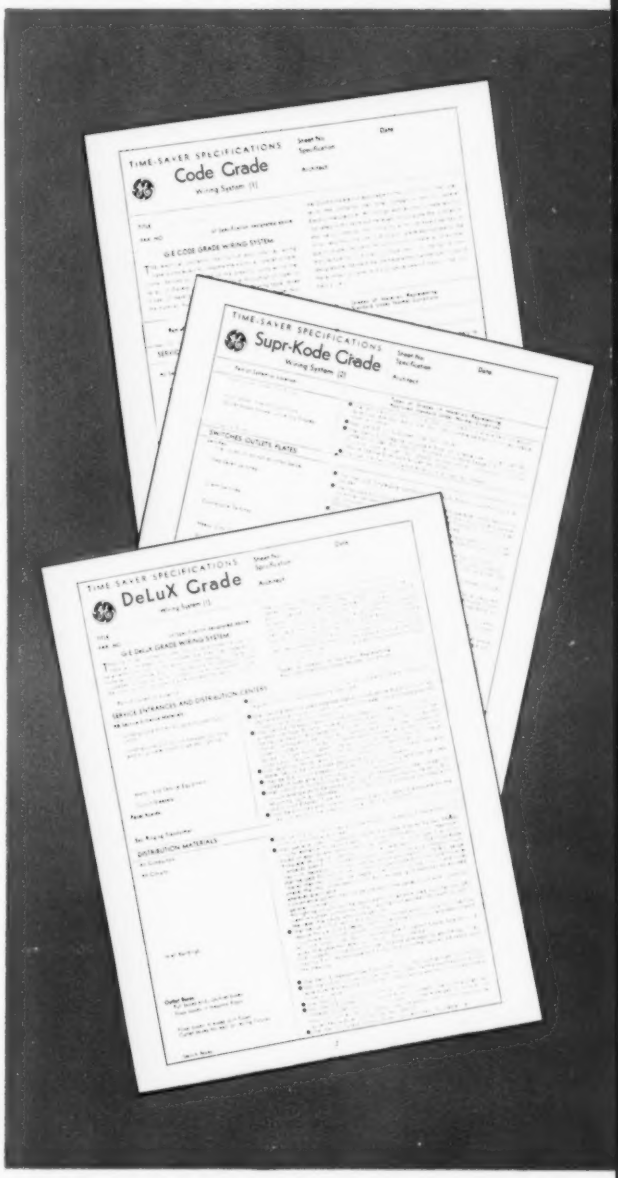

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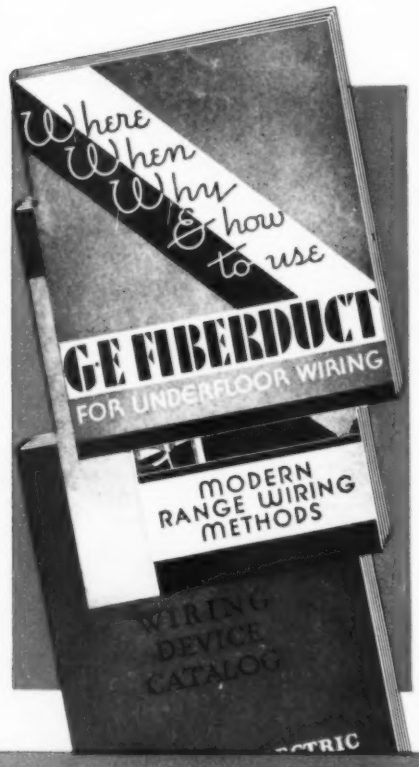

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- ☐ MODERN RANGE WIRING MANUAL
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for 130 amp., which would require No. 00 wire.

It would not be proper to install a lighting feeder of two No. 3/0 and one No. 2/0 as a diversity factor is allowed only where the feeder capacity is over 200 amps.

For a feeder of 225 amp. a No. 3/0 neutral could be used with two No. 2/0 outside wires as the demand factor above 200 amp. is 70 per cent.

APPLIANCE CORDS

According to 806-e, flexible cords No. 18 or larger, approved for specific devices on medium duty appliance branch circuits shall be considered protected by 25 amp. fuses.

1. I thought all cords were approved.

2. What is meant by specific devices?

3. I interpret this rule as allowing No. 18 cord to be used to supply a 1650-watt heater if used on a medium duty circuit? If so I should think it would be a hazard. Why don't they insist on No. 10 cord being used?

Our correspondent has mis-read one word. The rule reads "approved *with* specific devices" instead of "approved for specific devices."

If a device of 15 amp. or 1650 volt-amps. or less is equipped with flexible cord leads and is so listed as approved, the attached cords will be considered as protected as the rule states.

1. All flexible cords are not approved. A few years ago only about 15 per cent of the flexible cord manufacturers' output was of the approved type and 85 per cent not approved, but today, very fortunately, and to the credit of the manufacturers themselves, the figures are practically reversed and about 85 per cent is of the approved type. This has been aided by the adoption of the bracelet label and the Identified Cord Movements throughout the country.

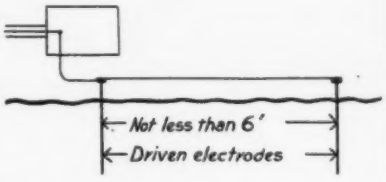
2. The specific devices are those appliances as approved and equipped with cords. Probably the majority of these are among the heaters as a class.

3. This rule would not allow No. 18 cord to be used with a 1650 volt-ampere heater. The values for current carrying capacities as given in Section 612-a would have to be followed. Here in the footnote we find the allowable carrying capacity of No. 18 cord is 10 amp. and of No. 16 cord 15 amp., when in cords for portable heaters and of type HC or HPD cords. Thus our 15 amp. heater would require a No. 16 cord which would then be considered as sufficiently protected by a 25 amp. fuse when used on an appliance branch circuit.

GROUNDING ELECTRODES

901-e states, "Where it is impracticable with one buried or driven electrode to obtain a resistance as low as 25 ohms, this requirement can be changed by using two electrodes at least 6 ft. apart and at least 6 ft. from any other grounding electrode."

Please make a sketch how this is done.



GAS FILLED LAMPS

What is the definition of a "gas-filled" lamp? This term appears in the Code in Section 1504-b and perhaps elsewhere. The term also appears in schedules for rating elevators and flour mills. I have been told by well-informed persons that all present day lamps are necessarily gas-filled, usually with a mixture of the inert group of gases.

I am anxious to learn what the hazardous characteristics of this type of lamp are, whether they are in common use and if they can be readily distinguished in some way by inspectors.

Incandescent lamps originally were of the vacuum type. That is, all the air was evacuated from the bulb in order that there would be no combustion of the filament when it was heated to incandescence. However, perfect vacuum was hard to attain and the even small particles of air as well as gases given off from metals within the bulb tended to shorten the life of the lamp. It was then found it was not necessary to require such a high degree of vacuum in the lamp if an inert gas was put in, as the gas, being inert, would

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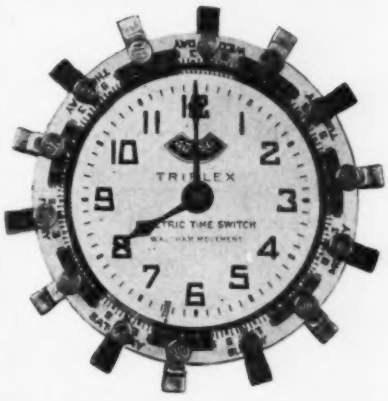
We suggest that contractors interested in refrigeration control equipment, write for catalog No. R-4.

MERCOID 7 DAY DIAL TIME SWITCH RELAY



The Mercoid Type T-710-V2 seven day dial switch is recommended for use with the Mercoid Dual Sensatherm in factories, churches, schools, libraries or other places where it is desired to control temperature to meet week end, holiday or special requirements. The rim which is equipped with seven sets of "on" and "off" clamps makes one revolution in seven days. The clamps can be set for any program for an entire week in advance. Waltham movement and Mercoid mercury switches used in these time clocks. The self-starting synchronous motor insures accurate electric time.

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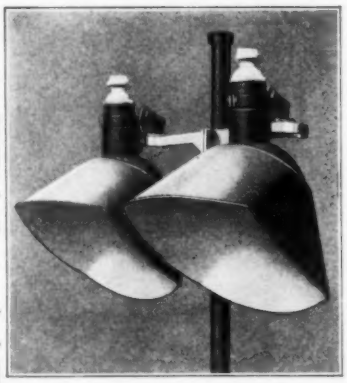
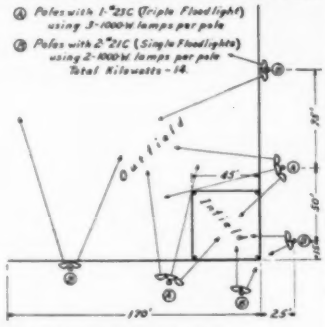
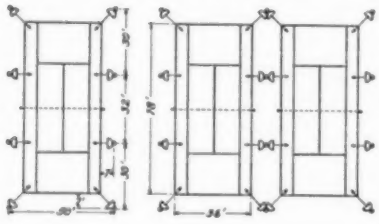


Bank of two floodlights made by clamping two single brackets back to back

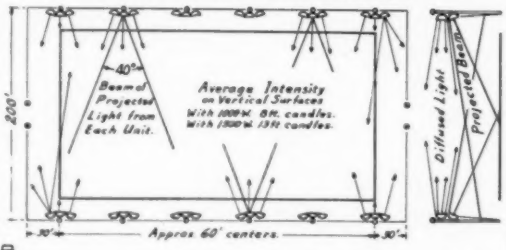
SOFT AND KITTEN BALL



TENNIS COURTS



FOOTBALL GRIDIRON



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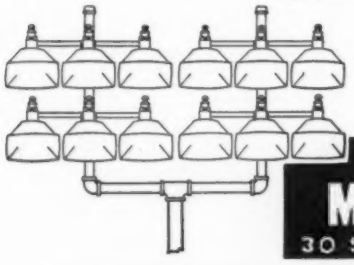

Bank of twelve Quad floodlights whose total weight is less than 150 lbs.

Quadrangle Manufacturing Co.
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not support any combustion of the filament. Of course, the gas is at a pressure much lower than atmospheric pressure in order that the expansion of the gas will not become so great as to burst the bulb. Nitrogen and argon are probably the most common gases used.

In a vacuum lamp the heat is radiated equally in all directions from the filament and its heat is dissipated pretty generally in all directions. But in the gas-filled lamps convection currents of the heated gas are set up much as would be in air. We all know that "heat rises". So, in the gas filled lamp the heated gas is forced upward from the filament by the cooler gas and we find that the parts of a gas filled lamp, directly over the filament become exceedingly hot. Anything which may collect on the outside of the lamp, such as dust, paint, etc., and which prevents radiation of the heat, may become hot enough to ignite. And, of course, too close proximity of these lamps to anything which burns easily or at a low temperature is dangerous. Practically all of the incandescent lamps today are of the Type "C" or gas-filled type and there seems to be no way of readily identifying them in the field.

HOW TO GROUND PORTABLE EQUIPMENT

908-m permits No. 18 wire for grounding portable and pendant equipment, if not fused over 15 amp.

1. How would it be possible to ground any equipment that is moved around a lot, that may be plugged in at some socket. Where would the ground be made each time? A 3-wire cord may be used (one to ground the frame of motor), but how or where would the other end be connected?

2. What is meant by pendant equipment?

This is pretty thoroughly explained in the 1933 Code under rule 908-j and explains the use of the multi-prong plug.

The contact in the receptacle for the extra or grounding prong of the plug would be grounded, either to the armor of the conduit or cable system, or to a separate grounding wire, but *never* to the neutral circuit conductor.

Pendant equipment is that which hangs such as fixtures, etc.

FOR CONTRACTORS

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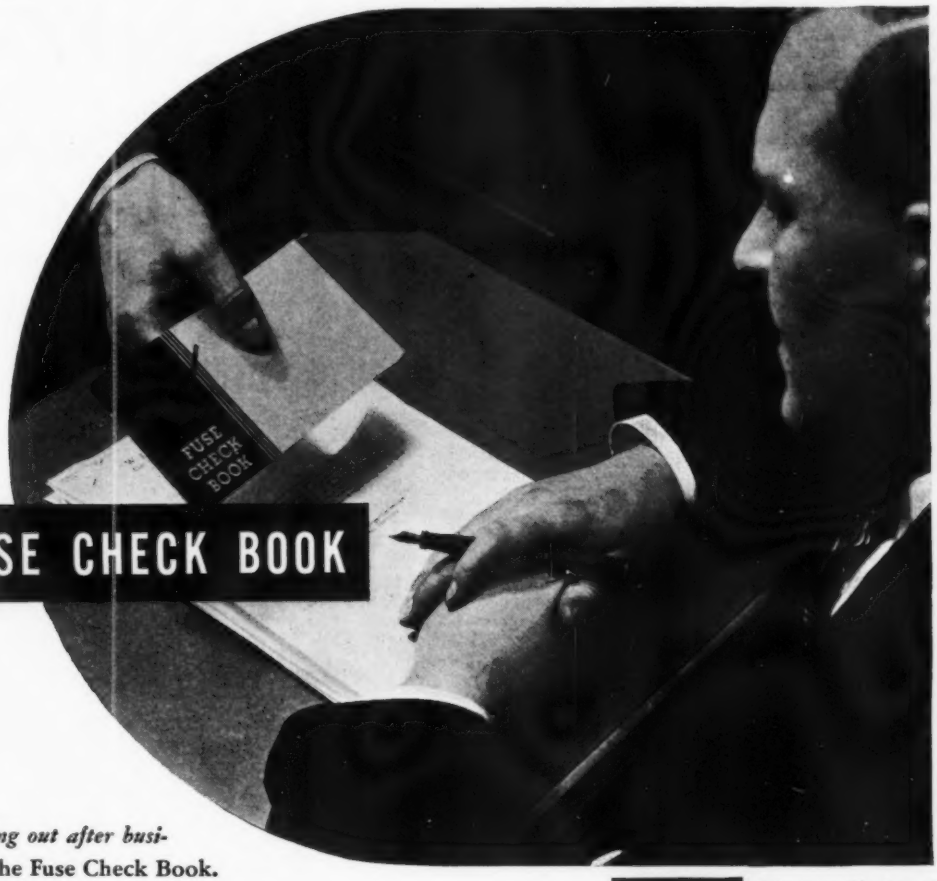

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THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD, CONN.

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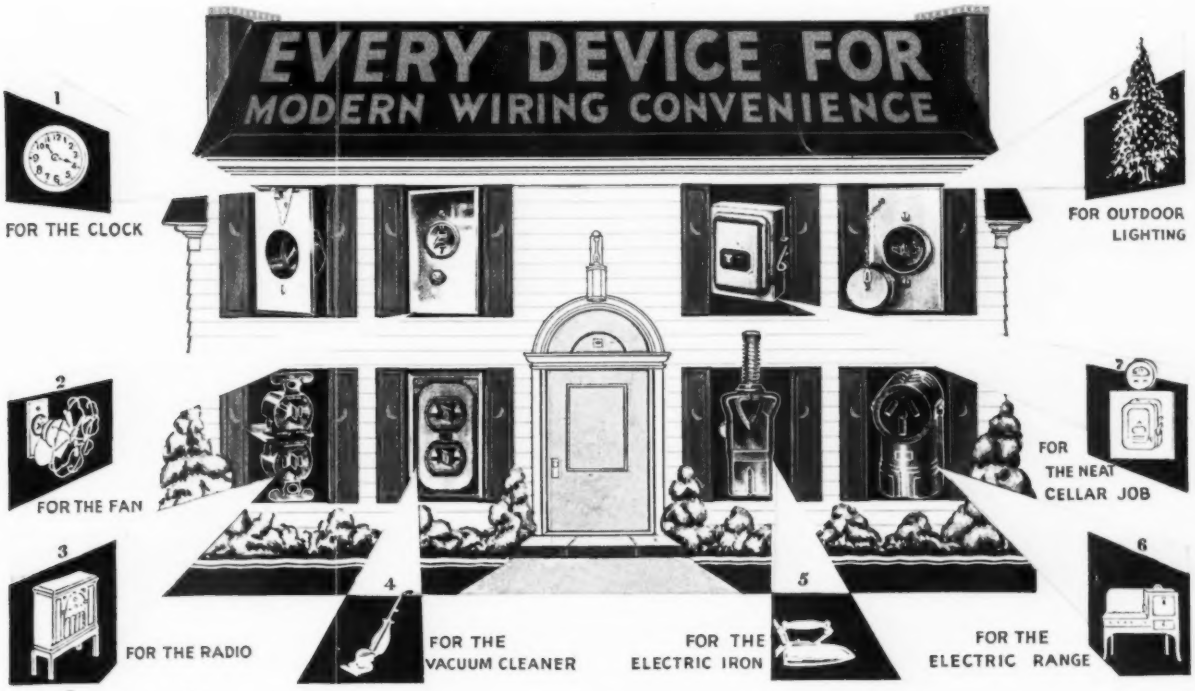

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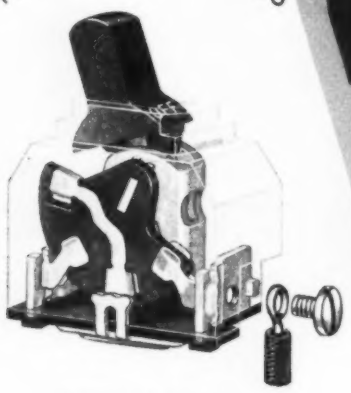

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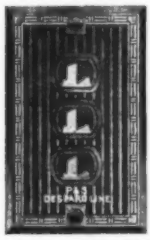

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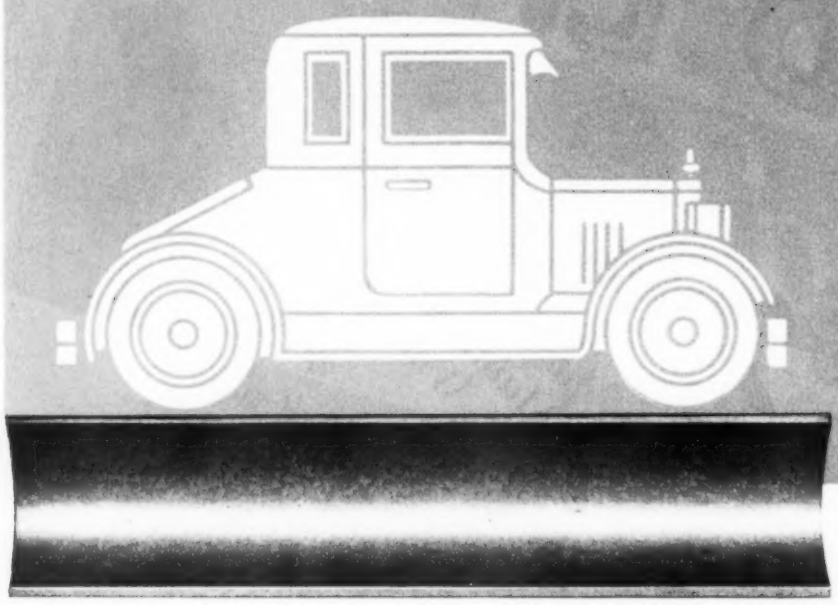
Write for your copy.

. . . A CONDUIT AS MOD



ELE ICA

• W DE

Electrunite Steeltubes Conduit with the knurled inside finish showed by actual test a saving of 30 per cent in the effort required to pull cable through. The cable rides the tops of the tiny knobs instead of making contact the entire length.

1924

Just as the streamlined automobile of today reflects the engineering effort directed toward the reduction of air friction in motor car travel, so ELECTRUNITE STEELTUBES reflects the most recent engineering advancement in conduit design—a design that minimizes internal friction between conduit and cable.

Steel and Tubes engineers, searching for a way to make conduit better, threw aside the old belief that the smoother the inside of the conduit the easier cable would go through. They worked out a knurled inside surface design that lifted the cable away from the wall of the conduit, so that instead of being in continuous contact with the wall the cable traveled over the tops of tiny knobs shaped like the tops of ball bearings. Experimental lengths were tried out. Tests showed a reduction of 30% in the effort required to pull cable. Test lengths were then sent into the field with

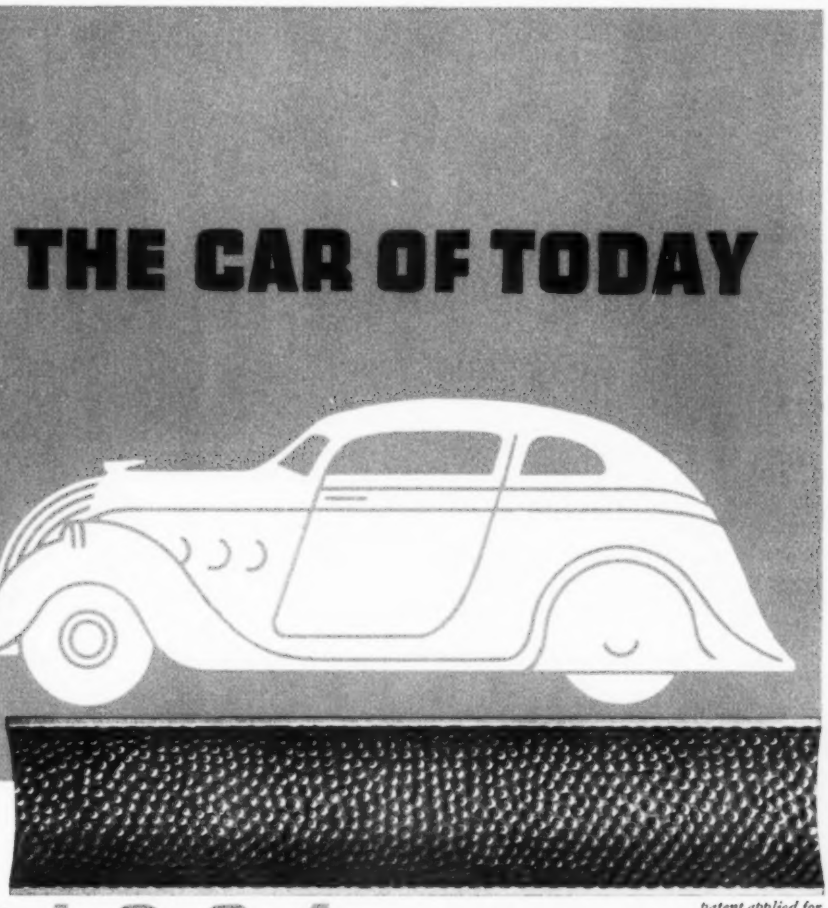
ELECTRUNITE Steel

REG. U. S. PATENT OFFICE

D·RN AS THE CAR OF TODAY

ELECTRICALLY

• WELDED •



patent applied for

1934

instructions to contractors to use them in actual installations and report their findings.

The results were so overwhelmingly favorable that today all ELECTRUNITE STEELTUBES conforms to the new design. Contractors everywhere who have tried it are enthusiastic. And their enthusiasm is justified by their cost records.

ELECTRUNITE STEELTUBES is easier to cut, to bend and to straighten and rebend. It requires no threading, as three simple fittings adapt it to any job. And now with the new knurled inside surface (patent applied for), it reduces the effort and time required for installing the cable.

ELECTRUNITE STEELTUBES is in a class by itself. No other electrical metallic tubing can offer the same advantages. Contractors are urged to try it on the next job taken at a close figure. The results will prove every claim.

eltubes

Electrical Division

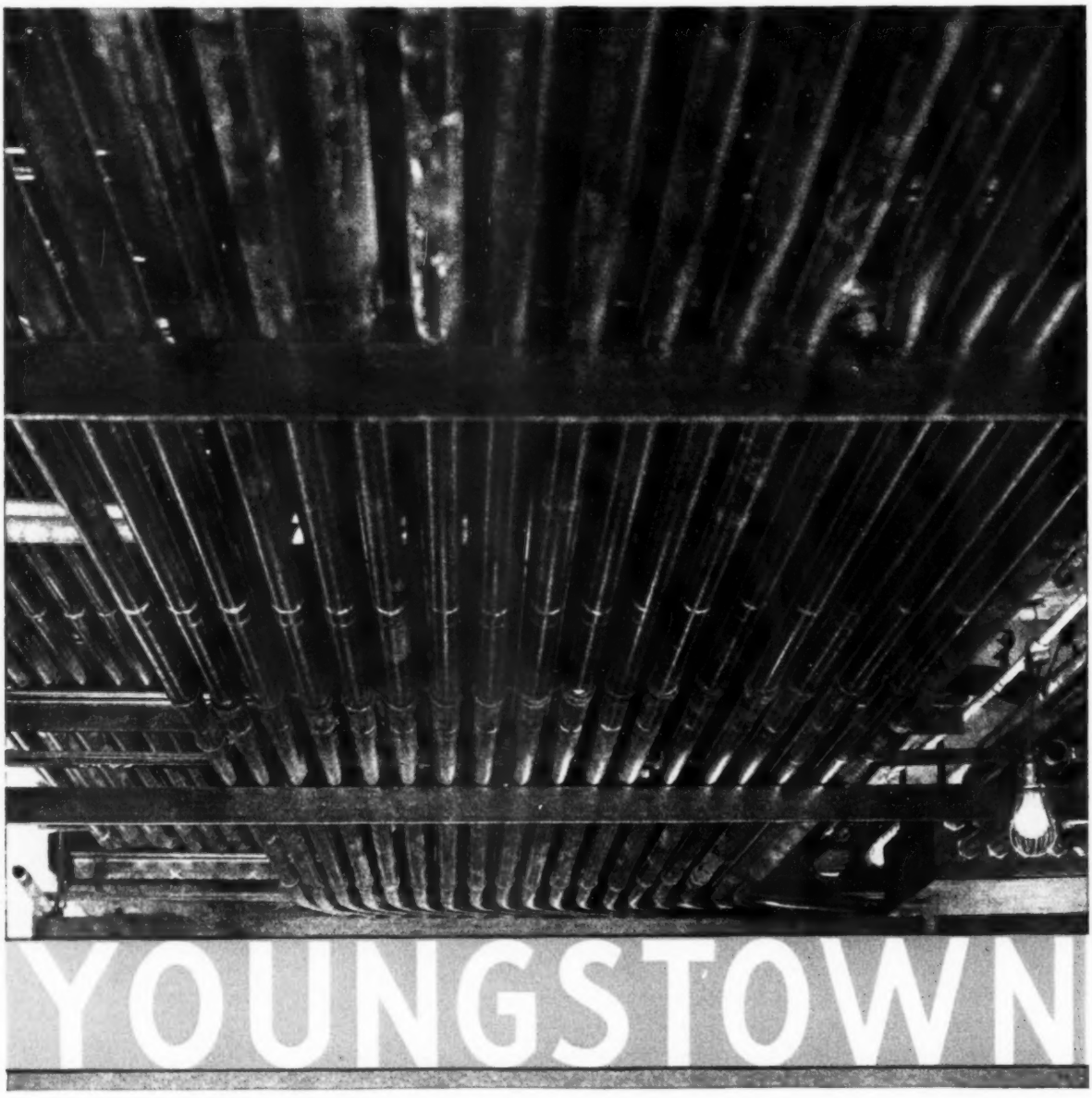
STEEL AND TUBES, INC.

WORLD'S LARGEST PRODUCER OF ELECTRICALLY WELDED TUBING

CLEVELAND • • • OHIO

A UNIT OF REPUBLIC STEEL CORPORATION

UMI



Only the highest grade, full weight, rigid steel conduit can give you the assurance of a permanent explosion proof electrical installation.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

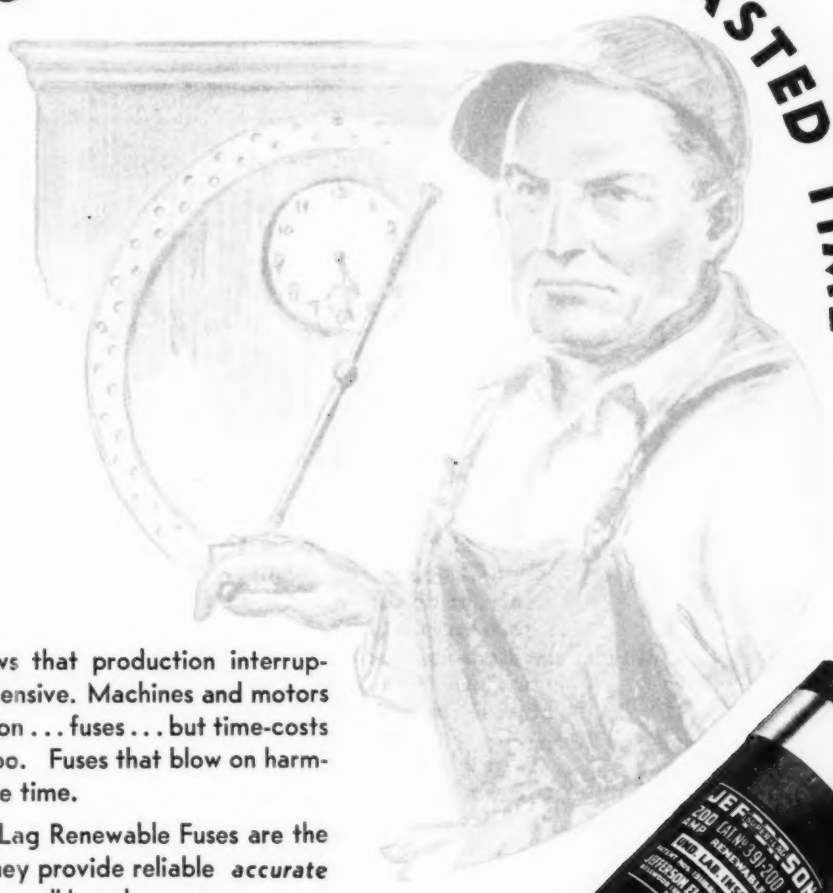
Manufacturers of Carbon and Alloy Steels

General Offices - - YOUNGSTOWN, OHIO

CONDUIT

BLACK ENAMELED - ELECTRO OR HOT DIPPED GALVANIZED

NOTHING COSTS AS MUCH AS WASTED TIME



ANYBODY knows that production interruptions are expensive. Machines and motors must have protection . . . fuses . . . but time-costs need protection, too. Fuses that blow on harmless overloads waste time.

Jefferson Super-Lag Renewable Fuses are the perfect answer. They provide reliable *accurate* protection—ride over all harmless surges, operate positively on dangerous overloads. There is no better protection for electrical equipment and property.

Jefferson Super-Lag Fuses are made in all capacities, both knife blade and ferrule types. Show the savings—tell the Jefferson Super-Lag Story and sell more fuses.

The secret of Jefferson Super-Lag performance lies in the lag plate which is a part of the Super-Lag link. This plate delays the normal fuse action to provide a time interval or *lag*. This time-lag prevents the fuse from blowing on harmless temporary overloads—to save needless shutdowns and many link replacements.

JEFFERSON ELECTRIC COMPANY
BELLWOOD *(Suburb of Chicago)* ILLINOIS

JEFFERSON
Super-Lag RENEWABLE **FUSES**

UMI

For general industrial and machine tool service.

STANDARD DUTY

For bottling plants, breweries, dairies, etc.

WATER-TIGHT, WEATHER-PROOF

For dusty applications such as grain elevators.

DUST-TIGHT

For motor control in explosive atmospheres.

EXPLOSION-PROOF

For operation in corrosive or explosive atmospheres.

CORROSION-PROOF

BULLETIN 709

THE WORLD'S MOST MODERN STARTER

AVAILABLE for Every Class of Service

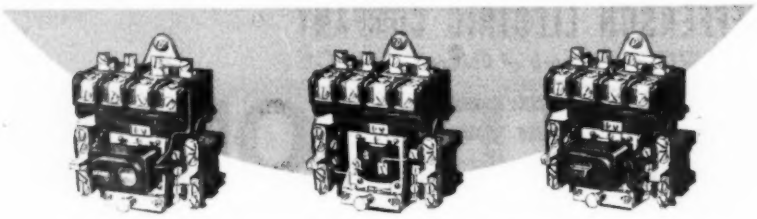
The new Bulletin 709 starter—the pacesetter for all across-the-line starting switches—is now ready for every type of industrial requirement. Also, the feature of small size with ample wiring space, found in the standard duty starter, has been retained for all applications.

Electrical contractors can now pick what they need from the standard Allen-Bradley line to fit any standard, dusty, or damp location. And when you figure on starters for corrosive or explosive atmospheres, you will also find a standard Allen-Bradley Bulletin 709 starter for such special jobs.

The Allen-Bradley line includes auxiliary controls, limit switches, and other accessories for every class of service. Use the Bulletin 709 starter for motors up to 3 H. P., 110 volts, 5 H. P., 220 volts, and 7½ H. P., 440-550 volts. Write for literature, today.

ALLEN-BRADLEY CO.
1307 S. First Street Milwaukee, Wis.

ALLEN-BRADLEY



THREE FORMS MEET EVERY INDUSTRIAL NEED

Latest Developments—Today's Prices

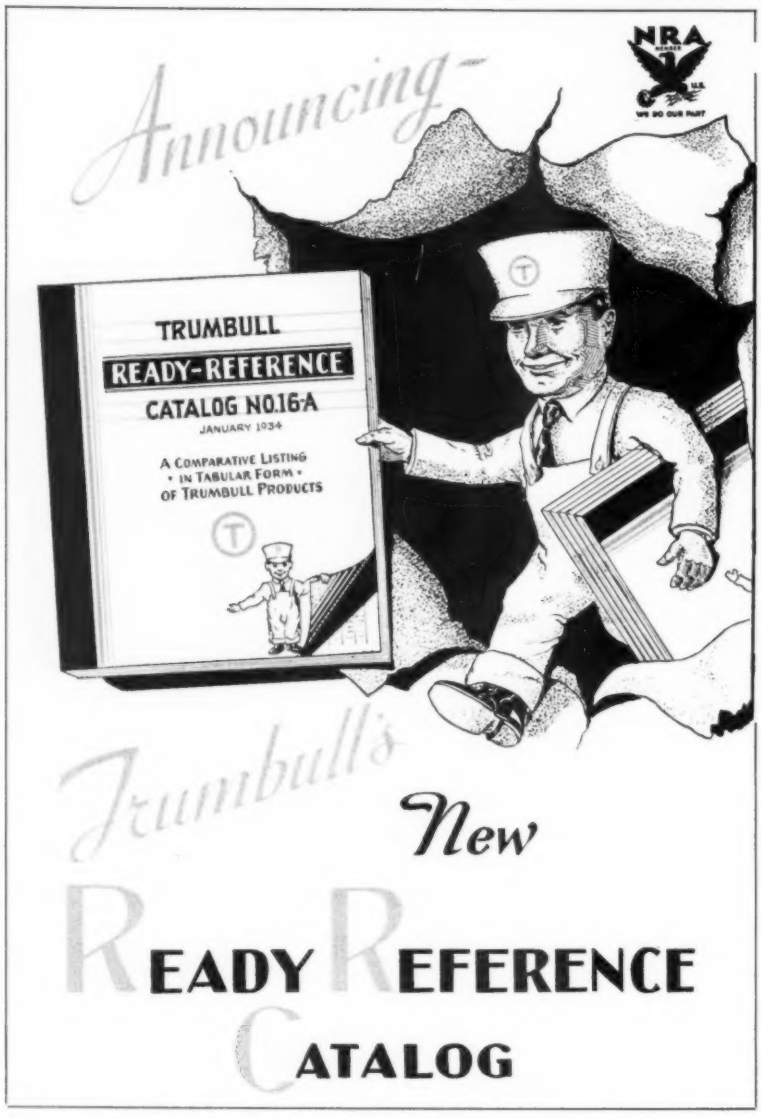
THERE has never been any catalog so complete with signaling information. Such a radically different modernization as the new Flush-call Line—replacing old-fashioned doorbells, etc.—is typical of the many advanced improvements in Edwards bells, annunciators, transformers, burglar alarms, telephones, etc.

The complete intact Edwards organization, balanced by the dependability of 62 years experience and the aggressiveness of youth, has been planning, experimenting and designing to be ready for your increased activity.

No side lines—Signaling remains our specialty and Edwards quality continues to be the standard. A wealth of new information plus today's up-to-the-minute prices makes this new Edwards catalog your 1934 Text Book of Signaling. Return the coupon at once for your copy.

EDWARDS and COMPANY INC.
140th and EXTERIOR STREETS • NEW YORK
TRADE 1872 MARK EDWARDS

Send the new EDWARDS SIGNALING CATALOG to
Mr. .....
Street .....
City ..... State .....
Please Check for Correct Listing and Future Mailings C
ELEC. CONTRACTOR—WHOLESALER—ARCHITECT—INDUSTRIAL



A NEW IDEA *in* CONDENSED CATALOG LISTING

A Striking Improvement in Catalog Design.

HAVE YOU A COPY?

THE fundamental idea back of the revolutionary type of catalog listings as developed in this Ready-Reference Catalog is to show together various types of material having similar ratings, uses, and in a general way come under the same classification.

The purchaser, under this method, may review at a glance, in one place, all the switches of various types available for any given rating and classification.

Brief descriptions and illustrations cover each type of product and enable you to select the switch you need at the price you want to pay. We believe this condensed form will meet with universal approval.

THE TRUMBULL ELECTRIC MFG. CO.

Plainville. A GENERAL ELECTRIC ORGANIZATION **Conn.**

Here is business you can get . . . NOW!

AUTOMOBILE service stations are brightening up. Owners and managers know the advertising value of good lighting. They are looking to the electrical contractor to help them do this lighting most effectively.

Benjamin advertising to owners and operators of service stations, gas and oil filling stations, parking places, etc., is creating new business now. The advertisement reproduced here is typical. And this is only one phase of our campaign.

In our advertising we are saying "Ask your electrical contractor about Benjamin Lighting Fixtures" because you can show these prospective customers better than any one else the special features of Benjamin service station lighting equipment.

Here are some of the jobs:

- Floodlighting station buildings and ground areas.
- Lighting pump islands and other local service areas.
- Lighting wash racks, greasing pits and lifts.
- Lighting tire and battery rooms.
- Lighting signs and bulletin boards.

Super Service Station
April, 1934

There is a specially designed floodlight or reflector to meet every requirement and price range of service station lighting.

There are many sales features in Benjamin equipment which will help you get these jobs and you will find it profitable to push the Benjamin line. Now is the time to go after this business.

The New Benjamin Portfolio of Selling Helps

The new Benjamin portfolio of selling helps, "How to get more service station floodlighting and other lighting installations" will help you. Write to us for your copy or ask your jobber's salesman for it.

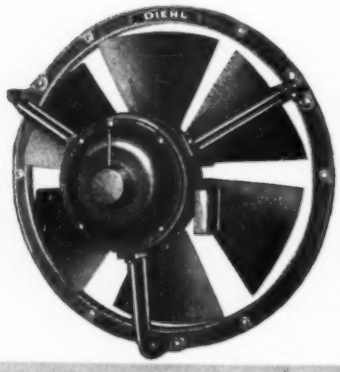
BENJAMIN ELECTRIC MFG. CO. . . . . Des Plaines, Illinois
NEW YORK CHICAGO SAN FRANCISCO

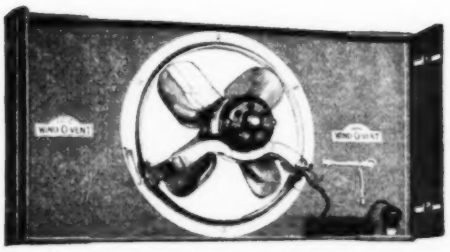
BENJAMIN FLOODLIGHTS
TRADE MARK

Ventilating Fans, both bucket or flat blade types from 9" to 16" in diameter.

Exhaust Fans, both bucket or propeller blade types from 18" to 60" in diameter.

Wind-O-Vent Kitchen Ventilators, for window mounting or built-in-wall installations.





If it's not ventilated —it's not

MODERN

Sell ventilation — easier to sell now than ever before. Air conditioning is in the public mind and in countless cases, a Diehl Exhaust or Ventilating Fan goes a long way toward air conditioning.

Many sales and installation opportunities exist—not only in homes but in offices, garages, restaurants, tap rooms, industrial plants and other locations. For all kinds of installations there are Diehl Fans to provide practically silent operation . . . exceptionally large air delivery . . . variable speed . . . vertical mounting . . . and other features required by various applications.

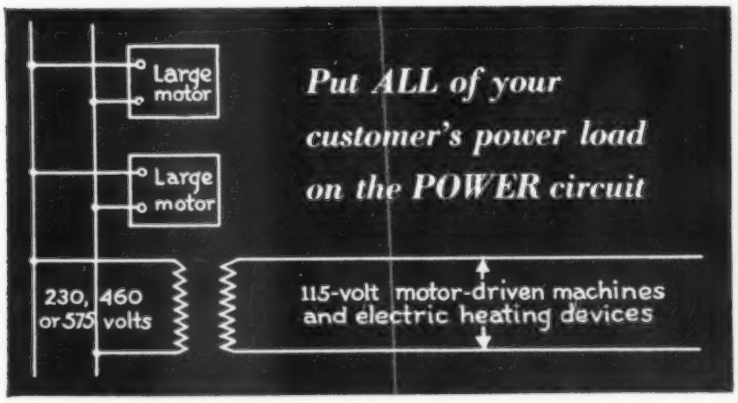
With the Diehl Ventilating Fan Line you can handle all ventilating jobs and make big profits. Write for the new Exhaust and Ventilating Fan Installation Catalog to the Diehl Manufacturing Company, Elizabethport, New Jersey. District Offices or Sales Representatives located in Atlanta, Boston, Chicago, Columbus, Dallas, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco and St. Louis.

DIEHL MANUFACTURING COMPANY

Electrical Division of

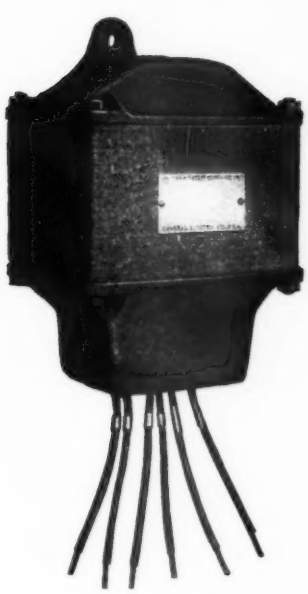
THE SINGER MANUFACTURING COMPANY

DIEHL FANS



Put ALL of your customer's power load on the POWER circuit

HERE'S PROFITABLE NEW BUSINESS FOR YOU



It's small
Easily installed
Put it anywhere
No inspection
No maintenance

HOW often small drills, compressors, vacuum cleaners, fans, soldering irons, glue pots, and similar shop appliances are connected to lighting loads!

This is not lighting load. By installing a small G-E air-cooled transformer for stepping down the voltage, these 115-volt devices can be operated from the power circuit. The saving in operating cost is considerable.

Now is the time to cash in on this new business. There are standard lines of G-E air-cooled transformers for many applications.

Your requirements for special voltage can be economically and quickly met from an extensive line of standard parts.

Write for our bulletin GEA-897D, which gives full descriptive and application data. Address General Electric, Dept. 6—201, Schenectady, N. Y., or call the nearest G-E sales office.

NRA

AIR-COOLED TRANSFORMERS

INSTALL G-E TIME SWITCHES FOR GREATER PROFIT

ARE expensive maintenance and service calls eating up all the profit on your time-switch installations?

This problem is practically eliminated when you sell G-E time switches. They have no clock to wind, and require no oiling or regulating. They are simply constructed, which means long life with freedom from petty troubles.

You profit — from every angle — by selling G-E time switches. The initial cost is fair, installation is simple, delivery is prompt, and you profit from the customer goodwill earned by their flawless operation.

May we send you further information on G-E time switches and timers? Address the nearest G-E sales office, or General Electric, Dept. 6—201, Schenectady, N.Y.

TIME SWITCHES

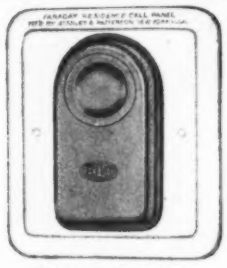
440-41

GENERAL ELECTRIC

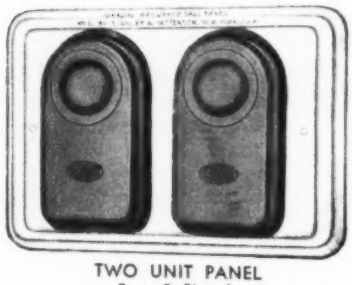
In every residence— INSTALL

"The Modern Electric Bell"

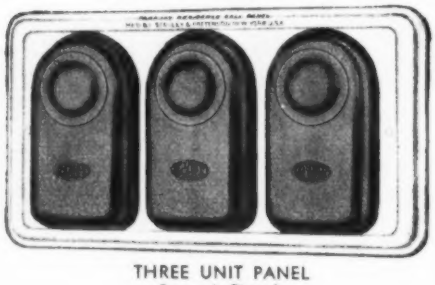
While new residential construction is just opening up—here is something modern in every respect, ***that can be sold to every home already built.*** There are millions of prospects for the sales of FARADAY RESIDENCE CALL-PANELS.



ONE UNIT PANEL
1 or 2 Signals
(6¼" wide x 7" high)



TWO UNIT PANEL
2 or 3 Signals
(9½" wide x 6½" high)



THREE UNIT PANEL
3 or 4 Signals
(12" wide x 6½" high)

FARADAY

Residence Call Panels

Ever since electric signals—bells and buzzers—were first installed in the home—whether an apartment or house—it was generally agreed that their appearance was unsightly and crude, really an "eyesore" in what, otherwise, was an attractive kitchen or hall.

FARADAY RESIDENCE CALL-PANELS represent the latest development in the bell-field. Their exceptionally attractive appearance appeals to every home-owner and particularly the housewife who is only too glad to get rid of the old-fashioned bell-assembly, now found in every apartment or house—the "sore" spot in any modern kitchen—and replace it with an up-to-date, decorative call-panel that harmonizes with the color-scheme of her kitchen.

Panels will be furnished on special orders with mounting-screws to fit any standard outlet-box for new-building work. Prices on application.

COLORS

The standard color of BACK-PLATES of panels is IVORY, in color-harmony with wall of any kitchen or hall, while the COVERS of the different-sounding bells and buzzers are regularly furnished in

JADE-GREEN, BLUE or IVORY

as may be specified. Special color combinations furnished to order.

If desired, covers can be exchanged for another color in a few seconds—green for ivory—or blue, etc.

Because of flexibility of various combinations very small stock investment is necessary to meet practically every signalling requirement.

Send for Catalog 61-A

STANLEY & PATTERSON

Incorporated — Established 1884

150 VARICK ST. NEW YORK, U. S. A.

UMI

N.E.C.A.
NEWS AND SERVICE INFORMATION

MATERIAL FOR THIS DEPARTMENT IS SUPPLIED BY THE HEADQUARTERS STAFF OF THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION
420 LEXINGTON AVENUE, NEW YORK, N. Y.

President, L. E. Mayer
14 North Franklin Street, Chicago, Illinois

Vice President, Earl N. Peak
1603 West Main Street, Marshalltown, Iowa

DIVISIONAL EXECUTIVE COMMITEEMEN

Eastern
Louis Kalischer
288 Livingston St.
Brooklyn, N. Y.

Central
F. T. Langford
511 S. Third St.
Minneapolis, Minn.

Western Canadian
J. H. Schumacher
344 Main Street
Winnipeg, Man.

Southern
D. B. Clayton
844 Martin Bldg.
Birmingham, Ala.

Mountain
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1957 South 5th East
Salt Lake City, U.

At Large
E. D. Brown
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Detroit, Mich.

Southeastern
W. W. Ingalls
315 S. W. 10th Ave.
Miami, Florida

Pacific
Lloyd Flatland
15th & Mission Sts.
San Francisco, Cal.

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Indianapolis, Ind.

W. J. Squire
401 Wyandotte St
Kansas City, Mo.

A. J. Hixon
22 Elkins St.
Boston, Mass.

J. G. Livingston
420 Lexington Ave.
New York, N. Y.

W. W. Clark
1428 Engineers Bldg.
Cleveland, Ohio

General Manager
Laurence W. Davis
420 Lexington Ave
New York City

Contractors Organized for Industry Welfare

SEPARATION OF CONTRACTS COMMITTEE

The Joint Committee on Separation of Contracts, consisting of John W. Hooley, Chairman, representing the National Electrical Contractors Association, Robert J. Barrett, president of the National Association of Master Plumbers, and Ray L. Spitzley, for the Heating, Piping and Air Conditioning National Association, have been working steadily to bring about separation of proposals for bids for the three mechanical trades from the general construction contracts on Federal buildings.

The bills introduced in Congress last year have been revised and reintroduced by their sponsors, Senator W. Warren Barbour in the Senate, and Congressman Patrick J. Carley in the House.

Meanwhile the joint committee is seeking to secure by an executive order the separation of contracts on public work coming out in the next few months. An appointment has been set for a conference on April 6 in Washington, for the joint committee to meet with W. E. Reynolds, assistant director of procurement of the public works branch of the treasury department.

Information of value to the joint committee should be sent to John W. Hooley, Chairman, Joint Committee on Separation of Contracts, 420 Lexington Ave., New York City.

CONSTRUCTION LEAGUE REPRESENTATIVES

The four representatives of N. E. C. A. appointed to represent it for 1934 on the general assembly of the Construction League are President L. E. Mayer, Vice-President E. N. Peak, H. B. Frazer of Philadelphia and J. R. Stolzenbach of Baltimore.

NEW EXECUTIVE COMMITTEEMEN

A. J. Hixon, Hixon Electric Company, Boston, Mass.; J. G. Livingston, J. Livingston & Company, New York, and W. W. Clark, Dingle-Clark Company, Cleveland, Ohio, have been elected executive committeemen-at-large.

The resignation of F. O. Sievers of San Francisco from the Executive Committee was announced at the committee meeting last month in Washington. Lloyd Flatland, Globe Electric Works, San Francisco, was appointed to succeed Mr. Sievers as representative of the Pacific Division.

Mr. Flatland has been exceptionally active in welding the contractors of San Francisco into a 100 percent organized industry.

SOUDER NAMED COUNCILLOR CHAMBER OF COMMERCE

L. T. Souder, Washington, D. C., has been appointed by the N. E. C. A. its national councillor to the Chamber of Commerce of the United States. The six additional delegates to the annual meeting of the Chamber in May will be appointed later.

EXECUTIVE COMMITTEE MEETS

The first regular meeting of the Executive Committee since the Kansas City Convention in 1932 was held in Washington, D. C., on March 3, 4 and 5. The meeting was almost entirely taken up with N.R.A. code matters. The appointments on a code authority and to Construction Industry Code Committees were made as previously announced.

It was voted to propose at an early meeting of the association the amendments to the constitution and by-laws required by the legal department of N.R.A. These amendments, which are required in order to secure approval of a code, are for the purpose of eliminating what the legal department claims to be inequitable restrictions on membership.

NEW N. E. C. A. CHAPTERS

Chapter No. 5 of New York City, covering jurisdiction over the interests of its membership in the City of New York, to be known as New York City No. 5 Chapter. S. J. O'Brien, 122 West 124th Street, New York City, President. Nicholas D. Lyons, 35 Maiden Lane, New York City, Secretary.

Westchester-Fairfield Electrical Constructors, Inc., covering jurisdiction of Westchester County, New York, to be known as Westchester County Chapter. George H. McKee,

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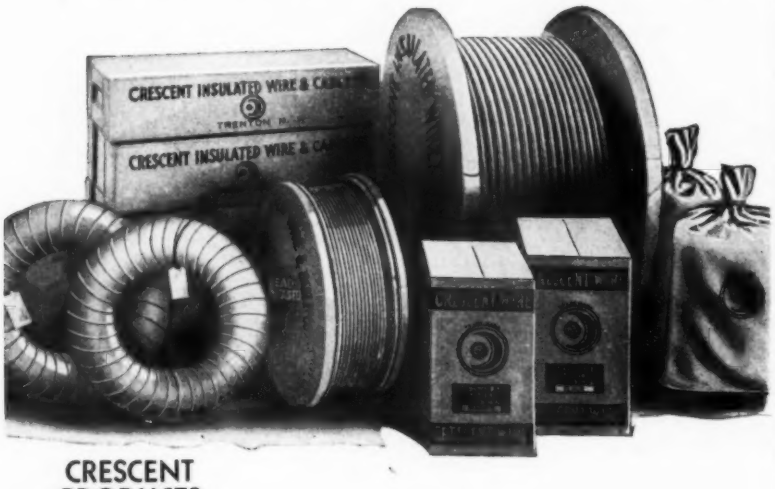
CRESCENT WIRE

offers every advantage to Contractor and Wholesaler alike



CRESCENT PRODUCTS
A COMPLETE LINE

"Crescent" National Electric Code Rubber Covered Wire and Cable.
Intermediate Grade Rubber Covered Wire and Cable.
"Imperial" 30% Rubber Covered Wire and Cable.
"Crescent" Lead Encased Wire and Cable.
"Crescent" A. B. C. Armored Bushed Cable.
"Crescent" Lead Covered Armored Cable.
"Crescent" Flexible Metallic Conduit.
"Crescent" Varnished Cambric Cable, Lead Encased or Braided.
"Cresflex" Non-Metallic Sheathed Cable.
"Crescent" Flexible Cords.
All kinds of special wires and cables.

WITH the most rigid requirements in force in our purchase of raw materials;

WITH quality predominant in every foot of our manufacturing process;

WITH warehouse stocks and representatives ready to serve you in principal cities everywhere;

THERE IS NO DOUBT that Crescent Wire and Cable as a product and as an organization truly offers every advantage to purchaser and handler alike.

WRITE FOR FOLDER DESCRIBING RECENT INSTALLATIONS

45 years of knowing how in every foot of Crescent Wire

CRESCENT INSULATED WIRE & CABLE CO. INC.
TRENTON, NEW JERSEY.

40 Depot Plaza, White Plains, New York, President. John E. Scharff, 40 Depot Plaza, White Plains, New York, Secretary.

NEW MEMBERS

The following applicants have been accepted into the N. E. C. A. since the publication of the list in the March issue:

DISTRICT OF COLUMBIA

Washington:
E. C. Ernst, Inc.
L. T. Washington

KANSAS

Topeka:
A. Tucker Elec. Co.

NEW YORK

Brooklyn:
Concord Elec. Co.

Mt. Kisco:
C. F. Boehmer
Rao Engineering Co., Inc.

Mt. Vernon:
Charles B. Bayles
Berman Bros.
Harry Haslett
Kirchhof Elec. Co.

New Rochelle:
Loweth Elec. Service
George Vogelsberg
Walsh Elec. Co.
Harry Weber

New York City:
Amsterdam Elec. Co.
Becker Elec. Co.
D. E. Bergin
H. Brown Elec. Co.
Richard Bullock
Chain Elec. Service
W. E. Chandler
David Coyne
Lewis S. Davis Elec'l Co., Inc.
Henry Drexler, Inc.
E. S. E. Elec. & Specialty Co.
Freer Elec. Co.
General Elec. Contrg. Co.
A. Edgar Goetz, Inc.
H. J. Elec. Co., Inc.
Harlem Elec. Co., Inc.
Joseph B. Josephson
Leo Elec'l Co.
Leroy Elec. Co.
Charles B. Montagriff
Fred Nachtigall
Newberger & Co.
Eugene Pettinelli & Bros.
Plymouth Elec. Co.
Garret M. Ross
Henry Schleyer
Julius Schwack
Sobel Elec. Co.
Times Elec. Co.
Tuna Elec'l Co., Inc.

Port Chester:
Harry T. Field
Port Chester Lighting Fixture Corp.

White Plains:
Gerster Elec. Co., Inc.

Yonkers:
Cucinell Elec. Co.
Louis Mayer Elec. Corp.
Palisade Elec. Co., Inc.

UTAH

Logan:
Cache Valley Elec. Co.

Use BRYANT Receptacles and Cord Sets

For Modern Range Installations

THE Bryant Range Receptacle provides the most satisfactory means for installing a modern electric range. Its use permits the disconnection and removal of the range without disturbing the wiring in any way.

The Bryant Receptacle is easy to install. It eliminates the necessity for carrying unsightly feed wires to the range and improves the appearance of the completed installation. The rugged construction and accurate design of this range receptacle assures safety and convenience.

Use a Bryant All-Rubber or Armored cord set with the Bryant Range Receptacle for complete protection against possible cord defects. All Bryant range connecting devices have the unqualified approval of the Underwriters' Laboratories, Inc. They provide the highest standard of installation and enable electrical contractors to comply with all local inspection requirements.

For further information see your nearest Bryant Distributor, or write now to The Bryant Electric Company, Bridgeport, Conn.

The Bryant Range Receptacle

The Bryant All-Rubber Cord Set

The Bryant Armored Cord Set

BRYANT Superior Wiring Devices

Manufactured by THE BRYANT ELECTRIC CO., Bridgeport, Conn.

MANUFACTURERS OF "SUPERIOR WIRING DEVICES" SINCE 1888 . . . MANUFACTURERS OF HEMCO PRODUCTS

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CONTRACTING news

INFORMATION OF INTEREST TO ELECTRICAL CONTRACTORS CONSISTING OF ITEMS OF NEWS, SHORT ARTICLES, PRACTICAL IDEAS, ETC., OUR READERS ARE INVITED TO CONTRIBUTE TO THIS DEPARTMENT

MAYER HEADS CODE AUTHORITY

In addition to the seven members selected by the Executive Committee of the National Electrical Contractors' Association to represent it on the Code Authority of the Electrical Construction Industry when a code shall have been officially approved, three non-members have been initially selected by the association to be recommended for appointment by the Administrator on the Code Authority. They are A. M. Woodfield, Philadelphia; William A. Ritt, Minneapolis, and Adolph Gogan, Milwaukee.

A preliminary organization meeting of the Code Authority was held in Washington on March 6. L. E. Mayer, Chicago, president N. E. C. A., was elected chairman of the Code Authority; E. N. Peak, Marshalltown, Ia., vice-president, N. E. C. A., was elected vice-chairman and General Manager L. W. Davis of the N. E. C. A., was appointed to serve as executive officer. The meeting also adopted a set of by-laws for the conduct of the Code Authority.

Sub-committees have been delegated by the Electrical Contracting Code Authority to prepare by-laws for local administrative committees, rules and regulations for the administration of the code, method of assessment and schedule of fees to be assessed upon all members of the industry for the financing of national and local administration and the gathering and compilation of statistics required by the Government, and development of procedure for local or regional collective bargaining for area agreements as to wages and hours. Action upon the recommendations of these sub-committees will be taken by the Electrical Contracting Code Authority at its first formal meeting to be held immediately upon the approval of the Electrical Contracting Code by the President.

FORSYTH HONORED BY NEW YORK INDUSTRY

Joseph C. Forsyth, consulting engineer, New York Board of Fire Underwriters, was guest of honor on February 28 of the entire electrical industry of the city of New York at a luncheon which was attended by more than 500 people.

Maurice P. Davidson, commissioner, Department of Water Supply, Gas and Electricity, New York, and John C. Parker, president of the Brooklyn Edison Company, who presided, brought to the attention of those present the conscientious effort that Mr. Forsyth put forth in the last forty-three years as a member of the New York Board of Fire Underwriters, and spoke highly of the contributions that he made toward better progress and regulation of electrical installations.

A framed resolution, on behalf of the members of the electrical association, was presented to Mr. Forsyth.

Mr. Forsyth, in addressing those in attendance, recalled some of his earlier experiences in the electrical industry, the progress that has been made, the wonderful opportunities that still exist for progress in this industry, and closed with the remark that while he is well along in years, he is young in mind and at all times will be glad to contribute his time to any branch of the electrical industry where his experience may be helpful in advising those who come to him.

C. W. A. REINSPECTION PROJECT FOR MINNEAPOLIS

Under the auspices of the Electrical League of Minneapolis the C. W. A. reinspection project started on March 5 with 25 inspectors. Reinspection covers industrial and commercial buildings which have been grouped into definite territories and two inspectors assigned to each territory. Each inspector is furnished with a survey sheet which must be filled out for each building inspected.

The survey reports are turned into the League offices for tabulation and for assignment of work to contractors. Each contractor receiving reinspection leads will be given a definite time in which to close the lead. Failing to do so, another contractor will be given the opportunity to close the job, after which, if the work is not corrected, the inspection department will take the responsibility for condemning it.

Originally this reinspection project was laid out for the entire state of Minnesota, but finding the project difficult to carry through in that manner, Oscar Frykman, chief electrical inspector for the city of Minneapolis, worked to secure the project for that city. Approximately $8,000 was allocated for the work which will enable it to be carried on for about eight weeks. The survey is being supervised by Emil Anderson, a graduate electrical engineer and former electrical inspector. The inspectors are former city inspectors, graduate engineers, former contractors and licensed journeymen.

NEW TREND IN LIGHTING EQUIPMENT

The lightng fixture industry has apparently come to the parting of the ways. Student architects, the pioneers of tomorrow, proved to be overwhelmingly in favor of built-in lighting units as contrasted with pendant lighting fixtures, judging from the recent results of the Beaux-Arts Illuminating Engineering Society Prize Award.

Only 3 out of 209 designs submitted by the architectural students called for the pendant lighting fixtures found in manufacturers' catalogues.

The problem set by the Beaux-Arts Institute, in conjunction with the Illuminating Engineering Society,

UMI

modern

as your 16 Time-Switch Markets

SANGAMO TIME-SWITCHES

TALK them—you'll SELL them

Your 16 time-switch markets are modern markets—calling for up-to-the-minute installations that demand an up-to-date time-switch to control them efficiently.

Such a time-switch is the SANGAMO—a modern time-switch that incorporates all the latest improvements by Sangamo Engineers.

You can depend on them to do the job right—and indefinitely—with the minimum of attention.

Go out after these jobs . . . Sell these modern markets . . . Talk the modern time-switch . . . SANGAMO . . . Talk them —you'll sell them . . . There's one to fill any time-switch requirement.

HERE are the MARKETS

1. Oil burner control
2. Ice machine defrosting
3. Apartment house lighting control
4. Beacon lighting control
5. Floodlighting control
6. Airport lighting control
7. Traffic lighting control
8. Billboard lighting control
9. Electric sign control
10. Ventilation control
11. Display window lighting control
12. Poultry house lighting control
13. Blower operation control
14. Automatic stoker control
15. Motor control
16. Oil filter control

SANGAMO ELECTRIC COMPANY • SPRINGFIELD, ILLINOIS

UMI

NUMBER TWO OF A SERIES OF ADVERTISEMENTS

FRETZ-MOON CONDUIT

is made from clean strip steel

IN COILS

When prevailing methods of manufacture will not produce the desired qualities in a product, then changes must be made or a new process developed. That is why Fretz-Moon Conduit is made by the "continuous process"—an exclusive method of manufacture—to obtain the uniformity in rigid steel conduit that contractors demand. • In ordinary methods of making similar conduit, short strips of metal are placed in a furnace for heating. When at the desired welding temperature, they are withdrawn individually and handled separately. • In striking contrast, Fretz-Moon Conduit is manufactured from mild open hearth steel rolled into strips from 300 to 1200 feet in length and formed into compact coils, as shown above. In following operations, the strip, a continuous ribbon of steel, passes through a specially designed furnace, automatically controlled as to temperature and speed of travel. This is the first step in the "continuous process"—a process designed to protect the original high quality of the steel and to produce a highly uniform product that bends, cuts and threads easier and faster.

STEEL AND TUBES, INC.
CLEVELAND • OHIO
EXCLUSIVE SALES AGENTS

FRETZ-MOON TUBE CO. ELECTRO GALV-ITE UNDERWRITERS LABORATORIES INSPECTED
FRETZ-MOON TUBE CO. ENAMEL-ITE UNDERWRITERS LABORATORIES INSPECTED
FRETZ-MOON TUBE CO. HOT DIPPED GALV-ITE UNDERWRITERS LABORATORIES INSPECTED CONDUIT MFI BUTLER, PA.

FRETZ-MOON Rigid Conduit

was the design of an interior for an Episcopal Church. To unify results the architectural students were given a floor plan, with instruction to work out an interior which would be harmonious both in its decoration and its lighting.

Only 15 per cent of the students proposed fixtures which could easily be made by lighting fixture manufacturers. The remaining 85 per cent called for designs which offered unusual problems to the fixture industry as it is at present organized.

A survey of the renderings made by A. L. Powell, vice-president, I. E. S., showed that one-third of the designs employed lighting units recessed above the ceiling. A number of these employed "pin hole" or "down light" units.

One interesting trend is the adoption of directional church lighting; a system so designed that the fixtures project light toward the altar. As a result, the members of the congregation are perfectly protected from glare.

Almost universally, lighting fixtures were protected by louvers, or by appropriate ornament. Many students used decorative grilles to conceal lighting fixtures, and others, still more original, projected light from statues which consequently stand out in silhouette against brilliant backgrounds.

The 209 drawings show the following designs:

Conventional Pendant Fixtures. 3%
Unconventional Fixtures with Built-in Reflectors 10%
Units Hidden above Ceiling....33%
Indirect Lighting from Wall to Wall 25%
Wall Grilles Projecting Light, and Illuminated Stained Glass Windows 16%
Direct Lighting Built into the Structure 13%

PHILADELPHIA TO HAVE CERTIFIED LIGHTING

Through its recently organized lighting committee the Electrical Association of Philadelphia is starting a "Certified Lighting Activity." Minimum standards of illumination have been set up covering all applications.

In the beginning the activity is being directed toward industrial and commercial installations. The plan is that such establishments, upon ap-

. . . . you get more features with F-M Motors

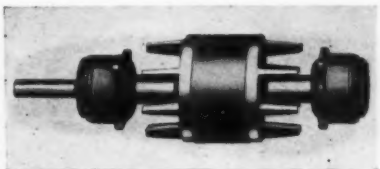
The best product wins! Today, purchasers are exacting—they scrutinize values. Features count heavily. The more outstanding features, the better your chances of turning a prospect into a customer.

You get more with which to sell when you equip your product with F-M Motors. A long list of F-M proven and accepted features become features of *your* product when you include this motor.

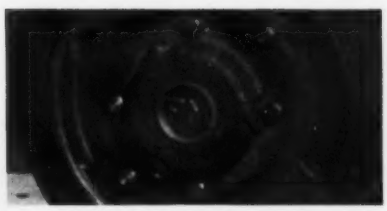
These motors meet the most exacting electrical specifications. But with characteristic thoroughness, Fairbanks-Morse has achieved a position of leadership in *mechanical* construction.

Fairbanks-Morse pioneered *mechanical excellence* in electric motors. It pioneered *ball bearings, grease tube lubrication, one-piece rotor construction.*

Pioneers in motor building progress, Fairbanks-Morse asks only an investigation of how much *more* these motors have to offer. Start your investigation by writing for full information. Address Fairbanks, Morse & Co., 900 S. Wabash Avenue, Chicago, Ill.

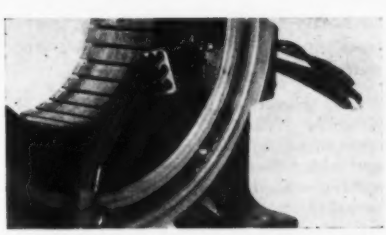


Complete rotor assembly with cartridge-type sealed ball bearings. Note rotor winding is of one-piece construction.



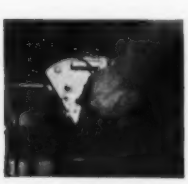
Lubricate sealed ball bearings once a year with tube contained lubricant. Bearings, dust tight. No lubrication drip.

Group wound coils—an entire phase group in a single piece of wire—lead connections from each group *welded*, not soldered or brazed.



Sealed-in leads through frame opening—anchored permanently. No chance for strain on field leads.

Slot insulation — self locking by means of cuff construction — permanent and additional protection for field windings.



Final vibrometer test —one of a series to insure a smooth running motor with minimum vibration.

Pioneer Designers and Manufacturers of POWER, PUMPING AND WEIGHING EQUIPMENT 104 Years

FAIRBANKS-MORSE
MOTORS

POWER, PUMPING AND WEIGHING EQUIPMENT

6085
EA40.61

Greenlee Bender in operation on standard conduit, also an installation where all bends were made on a Greenlee.

WHEN YOU FIGURE A NEW JOB
Plan To Save With Greenlee Tools

YOU may be sure, too, that you will make a saving, if 1¼-inch or larger conduit is to be bent and knockouts are to be enlarged, because in practically every case these tools have more than paid for themselves on the first job. Our authority for this statement are the testimonials of many contractors who know from experience.

These contractors have told us that Greenlee Hydraulic Conduit Benders save money by bending conduit faster and easier than by other methods; by making smooth, even bends; by eliminating the need for many manufactured fittings; and by making it easier to pull in wire and cable. Many of them know, too, that Greenlee Knockout Tools save time and do a smooth job without filing or reaming.

You may have complete information on Greenlee Tools, without obligation. Just write us or use the coupon. And don't forget to note the other tools listed below.

Other GREENLEE Tools

Hydraulic Pipe Pushers
Joist Borers — Bit Extensions
Electrician Bits

Greenlee Hydraulic Bender with attachments for bending thin-wall steel conduit. Bends 1¼, 1½ and 2-inch sizes, easily, quickly, and without crushing.

Greenlee Knockout Tools

Used for enlarging holes in cabinets, panel boards, etc. Leave clean, round holes. No filing or reaming. Punches make enlargements for ½ to 2-inch conduit. Cutter makes enlargements for 1½ to 3-inch conduit.

GREENLEE TOOL CO., Rockford, Ill.

Mail This Coupon Today

GREENLEE TOOL CO., ROCKFORD, ILL. Date.....

Please send information on the following Greenlee Tools.....

.....

Name.....Address.....

City..... State.....

My Jobber is.....4-34

plication to the association, may have their lighting checked and if it measures up to the required standards, it will be certified as adequate.

OUTLETS IN RED SEAL HOUSES INCREASING

The average number of outlets in Red Seal homes increased over 10 per cent last year in Kansas City according to a recent report of the Electric and Radio Association.

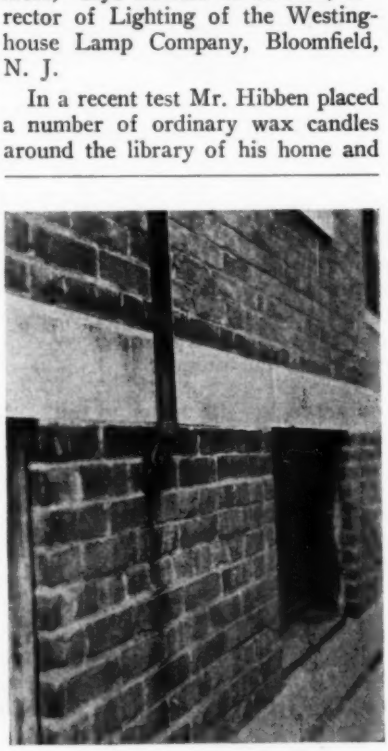
In 1932, 162 Red Seal houses averaged 74 outlets per home. In 1933, 92 Red Seal houses averaged 85 outlets each.

The average 1933 Red Seal house showed a decided increase in outlets for radios, refrigerators, ranges, telephones, ventilating fans and clocks.

CANDLE LIGHT COSTS 167 TIMES ELECTRICAL

"To reproduce with candles electric illumination at the household reading chair would cost 167 times more," says Samuel G. Hibben, Director of Lighting of the Westinghouse Lamp Company, Bloomfield, N. J.

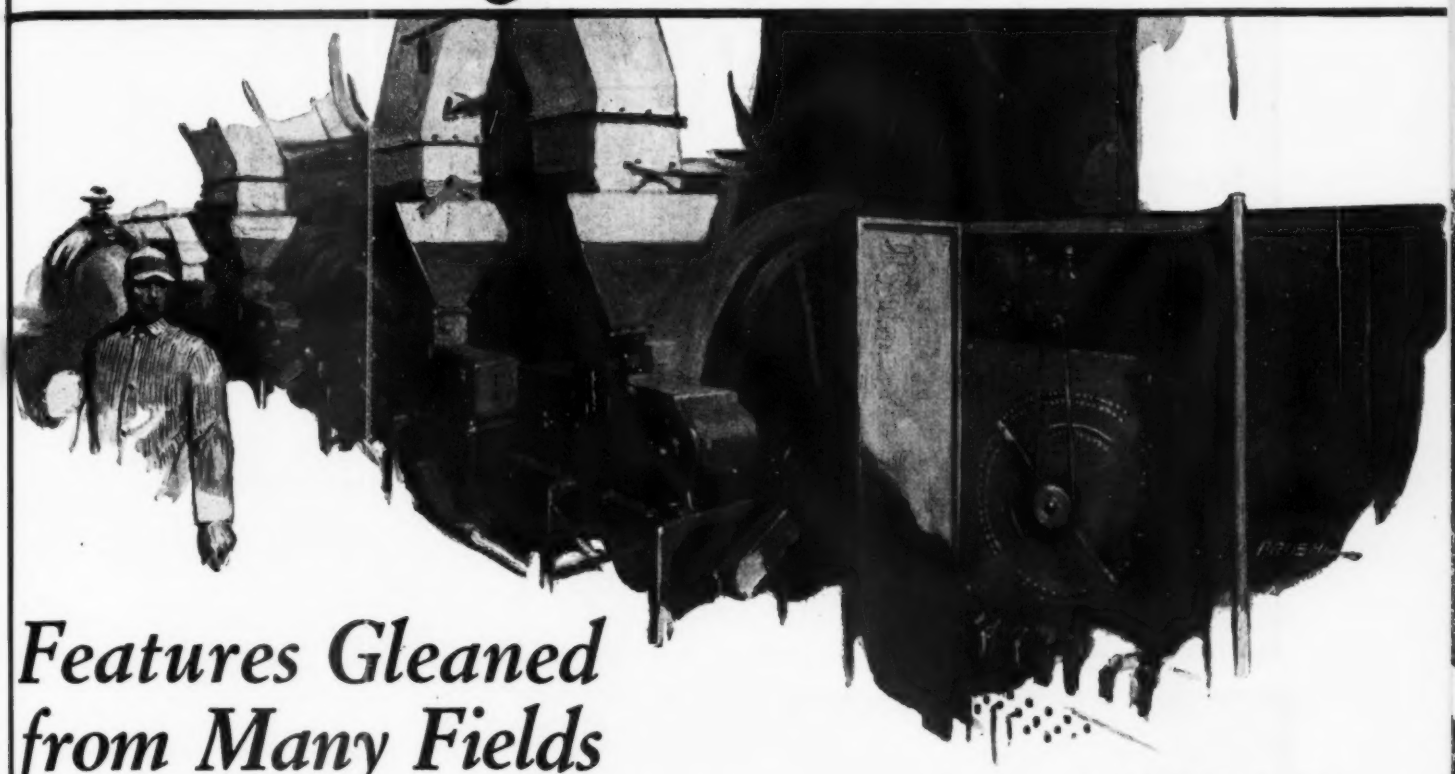
In a recent test Mr. Hibben placed a number of ordinary wax candles around the library of his home and



CHILDREN WERE PLAYING AROUND: Photograph of a service entrance where L. B. fitting had rusted away leaving service wires exposed only a few feet from the sidewalk. This was on the side of an apartment house.

CUTLER C-H HAMMER

Safety Switches



Features Gleaned from Many Fields

Cutler-Hammer Control in the boiler room of a modern power plant . . . one of the thousands of places in Industry where C-H engineers have solved unusual electrical problems.

For forty years Industry has carried the problems of electrical control to Cutler-Hammer engineers. Within power plants, mines, steel mills, cement plants, laundries . . . wherever electric power was at work . . . Cutler-Hammer met the widely varying problems.

Such specialized experience is reflected in C-H Safety Switches—the complete line of standard, weather-proof, dust-proof and explosion-proof switches. Each is built especially for its service, built to the unsurpassed C-H standards and geared to the requirements of electrical people.

C-H Safety Switches are easy to sell and easy to install . . . economical and dependable to use. Complete stocks are carried by responsible independent wholesalers. CUTLER-HAMMER, Inc., *Pioneer Manufacturers of Electric Control Apparatus,* 1306 St. Paul Ave., Milwaukee, Wis.

o o o

Meter Entrance Switches: *Cutler-Hammer also manufactures a comprehensive line of Meter Entrance Switches, designed to meet varying local requirements. Send for catalog.*

CUTLER C-H HAMMER

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WIREMOLD
"MONEY MAKERS"

Keep these two in mind!

←No. 5748S
Designed for standard shallow receptacles.

No. 5747 →
Takes all standard receptacles and shallow switches.

(1⅛" Deep Outside) (1⅜" Deep Outside)

Always remember this: There is a Wiremold fitting especially adapted to each condition you have to meet—both in planning the job and in selling the customer!

The Wiremold Co., Hartford, Connecticut

PORTABLES
that meet every requirement

The eight portable lamp guards pictured here present only a portion of the extensive McGill portable guard line.

McGill Portables designed to meet every imaginable need, bring directed and protected light to every job and every worker.

McGill Portables perform a multiple duty; they guard light bulbs against breakage, and guard workers from the danger of serious injury. They protect workers from strain due to improper lighting conditions, and protect your invested dollars against unnecessary losses... Write for our interesting catalog describing the entire McGill line of portable lamp guards.

McGILL MANUFACTURING CO.
Electrical Specialties of Quality
ESTABLISHED 1904
VALPARAISO · INDIANA
Box No. 670

made intensity measurements to see how their illumination actually stacked up against that of incandescent lamps. Plain paraffin candles of the 5-cent variety burned at the rate of 1.1 in. per hour, or cost 88/100th cent per hour to burn.

On the other hand, a 60-cp. lamp bulb costs only 20 cents and the average cost of burning it is ⅓ cent per hour. Adding lamp bulb costs to electric current costs gave an hourly operating cost of about 35/100th cent, or equal altogether to about 6/1000th cent per candlepower per hour, based on an average life of 1000 hours for a bulb.

Electrically, 1c each hour buys 167 candlepower of light. With wax candles 1c hourly buys just about 1 candlepower. Hence, candles cost 167 times more than electricity.

ELECTRICAL SHOW FOR MEMBERS OF INDUSTRY

A new idea in electric shows, namely an exhibit for the industry rather than the public, was staged on March 8 and 9 by the Electrical League of Minneapolis and brought forth an attendance of approximately 600.

Twenty-three exhibitors displayed the latest improvements in wiring and construction materials and specialty electrical installation equipment.

ELECTRIC GARDEN SHOW

The first electric garden show was opened by the Electric League of Cleveland on March 10.

Electrical equipment shown consisted of soil-heating apparatus; utilitarian and decorative lighting for the garden; miscellaneous garden adjuncts and lamps with brackets to hold potted plants.

WALTER D'ARCY RYAN

Walter D'Arcy Ryan, famous General Electric illuminating engineer, died at his home in Schenectady, March 14, of heart trouble.

Spectacular lighting, artistic in the highest degree, brilliant street lighting laid out on a city-wide scale and based upon scientific studies of the requirements, the birth of floodlighting, the establishment of the profession of illuminating engineering—all of these were linked with the name

names
that have
made
history..
Zachary Taylor
Twelfth President of the United States, Born November 24, 1784
Famous military leader in the Mexican War, 1846-1848. Prior to embarking on his Mexican campaign he sought out Colonel Samuel Colt, founder of Colt's, and placed a contract for revolver equipment that aided materially in the success of the campaign.
COLT
NOARK

SWITCHES

For a century Colt's has devoted itself to the manufacture of quality products. The Colt-Noark line of Safety and Meter Switches has, through this devotion to quality, acquired a reputation for dependability and salability that stands unchallenged.

The Colt-Noark line is complete. It provides a switch for every specific need from meter service to motor starting.

Contractors, intent upon making sales history with a history-making line, should write for information TODAY.

COLT'S PATENT FIRE ARMS MFG. CO.

Pioneers of Protection Since 1836

ELECTRICAL DIVISION HARTFORD, CONN.

Boston Chicago New York Philadelphia

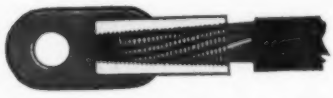
Pacific Coast Representative: H. B. SQUIRES CO. — SAN FRANCISCO, LOS ANGELES, SEATTLE

EC 4-34

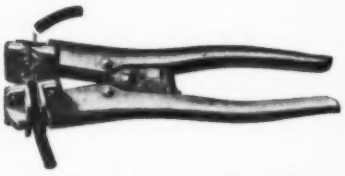
SPEED WORK—CUT COSTS *with these* IDEAL PRODUCTS

In spite of rising costs, you can keep your wiring prices and quotations at reasonable levels by using Ideal Time Saving Products.

Ideal Wire Connectors are solderless and tapeless—make better electrical contacts and stronger mechanical joints; and the installed cost is less.



Ideal Thread Lugs make an unsurpassed electrical contact and a connection which never lets go on overloads. No solder required. These Ideal devices eliminate the necessity for blow torches, delays to heat a soldering iron or fumbling with flux, solder and tape in cramped quarters.



E-Z Wire Strippers enable an Ideal Connection to be made quickly and satisfactorily and also produce a neater job.

Free Sample

Send for free samples of Ideal Solderless, Tapeless Wire Connectors. Test them on your own jobs under all conditions, and you'll use them regularly.

Approved by Underwriters' and Factory Mutual Laboratories. Recommended by National Electric Code

Ideal Commutator Dresser Co.
1041 Park Avenue, Sycamore, Ill.

Ideal Commutator Dresser Company,
1041 Park Avenue, Sycamore, Ill.
Gentlemen:
Please send:
☐ Free samples of Ideal Wire Connectors.
☐ Information on Ideal Thread Lugs.
☐ Information on E-Z Wire Stripper.

Name .....
Street .....
City .....

of Ryan. The illumination of two of the biggest expositions of modern times, the Panama-Pacific International Exposition at San Francisco, in 1915, and the Century of Progress Exposition at Chicago in 1933, were designed by Mr. Ryan.

CALIFORNIA SAFETY RULES ABOUT TO BE ISSUED

A new edition of the California State Safety Orders is now on the press and will be issued within a month, according to George E. Kimball, electrical engineer for the State Industrial Accident Commission. The orders have been revised to conform more closely to the National Electrical Code of 1933 and have been in process of revision for two years.

INCREASED BUSINESS ACTIVITY

A strong uptrend has been established in the electrical supply trade according to a report from Dun & Bradstreet. The general outlook, it was stated, is far more favorable than at the beginning of last year.

DISAPPEARING APPLIANCE CORDS: Experimental installation of disappearing connecting cords in the model Electric Kitchen of the Electrical Association of New York. Whenever service is required for any of the appliances used on the work-bench of this electric kitchen, there is no need of looking for connecting cords or of taking needless steps to cupboard or drawer where they are kept. The cord is simply drawn from the convenience outlet to the appliance at the required length, up to 8 ft. When no longer needed, it is disconnected from the appliance, given a gentle jerk and it rolls up and away from interference with the preparation of foodstuffs that may be underway.

SHERMAN

SHERMAN Solderless Service Connectors are used for all purposes where reliable Electrical and Mechanical Solderless Connections are required —for Primary, Secondary, Service and Transformer.

SOLDERLESS SERVICE CONNECTORS

These are the universally accepted type but have additional improvements and advantages—nut easy to start; no sharp edges; tight contacts; wire size part of SHERMAN catalog number, easy to order and use; bolt, spacer and nut an integral assembly; tough bronze in every part.

Order thru your Jobber

H. B. SHERMAN MFG. CO.
BATTLE CREEK, MICHIGAN

MINERALLAC PRODUCTS

1. 2.

HANGERS FOR CABLES & CONDUITS

Easily the best for quick, low-cost installation work. Send for full details and costs.

1 Hanger without Porcelain Bushing. Spring steel; stronger, quicker, more compactly arranged.

2 Hanger attached to steel beam with bolt and nut.

3 Jiffy Clip—quicker, neater work at less cost.

4 Cable Joint or Pothead Compound—8 grades for every system, underground or overhead.

3.

JIFFY CLIPS

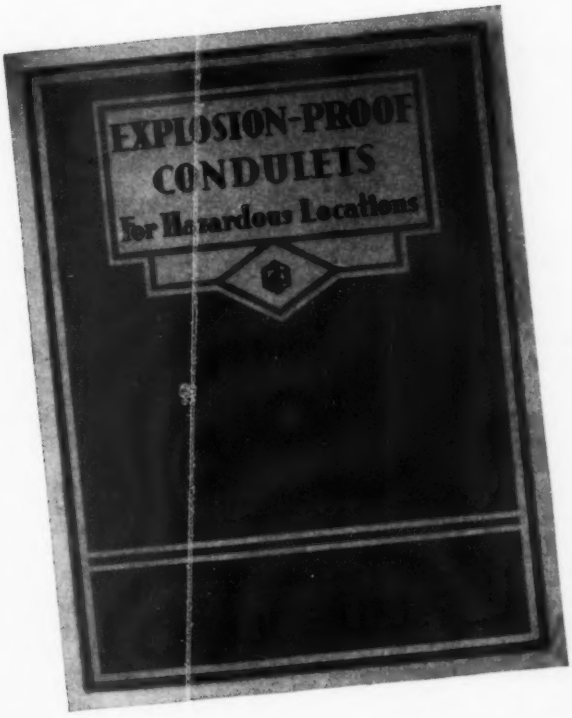
4.

Insulating Compounds

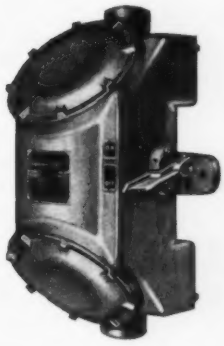
MINERALLAC ELECTRIC CO.
25 North Peoria Street, Chicago, Ill.

ANNOUNCING

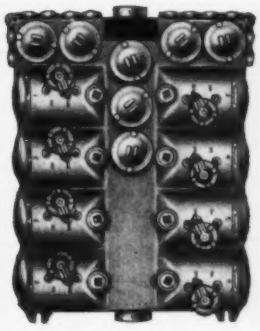
A New Bulletin Explosion-Proof CONDULETS



Lighting Fixture



Circuit-Breaker Condulet



Panelboard

CROUSE-HINDS
SYRACUSE, N. Y., U. S. A.

WE DO OUR PART
N E M A CODE

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Fill Out and Mail Coupon for Your Copy

CROUSE-HINDS COMPANY,

Gentlemen:

Please send me Explosion-Proof Condulet Bulletin No. 2282.

Name .....

Company .....

Address .....

City ..... State .....

BURNDY
SERVIT

The strongest service tap
. . . now made of DURIUM

BURNDY
ENGINEERING CO., INC.
305 EAST 45TH STREET, NEW YORK
Agents Everywhere

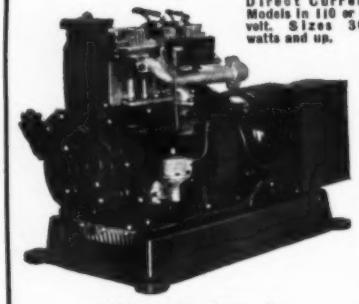
A. C. ELECTRIC
GENERATING PLANTS

The Sale of MODERN A. C. PLANTS brings calls for WIRING, FIXTURES, APPLIANCES, and EQUIPMENT

ONAN ALTERNATING CURRENT PLANTS operate on Gasoline, Gas or Distillate. COMPLETE, READY to RUN. Built in sizes 300 to 50,000 watts. Supply 110 or 220 volt, 60 cycle, single or three phase current. For use where power lines are not available, for standby equipment, Public Address and Sound Car Installations.

Operate A. C. Radio Washing Machines, Water-Pumps, Refrigerators, Motors, or any equipment operated from city current can be run on ONAN A. C. PLANTS.

D. C. Models as Low as $99.00
Direct Current Models in 110 or 32 volt. Sizes 300 watts and up.



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NEWS MANUFACTURERS

A DEPARTMENT FOR THE ANNOUNCEMENT OF ACTIVITIES OF MANUFACTURERS THAT ARE OF INTEREST TO CONTRACTORS, SUCH AS CHANGES IN EXECUTIVE PERSONNEL, BRANCH OFFICES, NEW PRODUCTS, ETC.

ARROW-HART & HEGEMAN MERGER UPHELD BY SUPREME COURT

The right of the Arrow Electric Co. and the Hart & Hegeman Manufacturing Co., Hartford, Conn., to merge was upheld by the Supreme Court, after The Arrow-Hart & Hegeman Electric Co. appealed from a Federal Trade Commission order refusing them permission to unite. The company declared that the reason for the merger was an effort to give the public lower costs and to maintain employment.

The commission ruled the consolidation of the two companies violated the Clayton anti-trust act, and ruled the consolidation of the two companies resulted in substantially lessening competition.

Justice Roberts, in handing down the court's decision, said it was unnecessary to consider whether competition was diminished since "the commission lacked authority to issue any order against the petitioner."

ALLEN NEW VICE-PRESIDENT WESTINGHOUSE MERCHANDISING DIVISION

A. E. Allen, formerly vice-president of Westinghouse Lamp Company, New York City, was elected vice-president of Westinghouse Electric & Manufacturing Company, in charge of the merchandising division. This division is now established as a separate operation distinct from other divisions of the company and Mr. Allen will have charge of all sales, manufacturing and engineering activities of this new division.

Mr. Allen has been with the Westinghouse company since 1902. Until 1925 when he was made general manager of the lamp company, his services had been in the electric company, first in the engineering division and afterwards in the sales department.

A. E. Allen

Announcement was also made of the election of D. S. Youngholm as vice-president of the Westinghouse Lamp Company, succeeding Mr. Allen. Mr. Youngholm will be located at the principal office of the Lamp Company at 30 Rockefeller Plaza, New York City.

A booklet entitled "Installing General Cable Trenchlay" has just been released by General Cable Corporation, New York City. The booklet covers recommended methods for the handling and protection of all types of low voltage Trenchlay cables and contains illustrations of Trenchlay constructions.

Wolverine Tube Co., Detroit, Mich., announces the appointment of the Wesco Company, 642 Lawrence St., Denver, Colo., representative for Colorado and Wyoming, succeeding the James H. Blum Co.

The Revival of A Quaint Custom

Let's revive the quaint custom of working to make a PROFIT, not merely to make sales.

Just Common Sense

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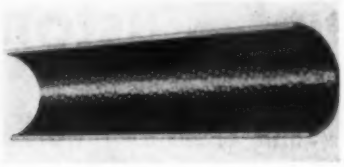
E. C. 4-34

UMI

April New Products

Metallic Tubing

Steel and Tubes, Inc., Cleveland, Ohio, has announced Electrunite Steel tubes, an improved electrical metallic tubing with a special knurled or pebbled internal finish to facilitate wire pulling.



The manufacturer states that tests show 30 per cent less tension is required to pull wire through conduit with the knurled inner surface than through smooth conduit because of less friction as the result of less surface coming in contact with the wire. This new metallic tubing has a tough enamel which the manufacturer states is hard enough not to interfere with the wire pulling, yet not brittle enough to break during bending.

Pilot Light Combination

Arrow Electric Division of the Arrow-Hart & Hegeman Electric Co., Hartford, Conn., announces a line of switch, recep-

tacle and pilot light combination known as the "Timesaver" line. Switch, receptacle and pilot light combination is assembled in an all-Bakelite base. Single switch takes standard size plate either of brass or Bakelite, and designed specifically for modern type C lamp loads. Mechanism is fully enclosed and sealed. Lights may be wired to work with either switch or receptacle part of combination.

Solderless Connectors

Solderless service connectors for making solderless line taps, primary, secondary, service and transformer, are announced by H. B. Sherman Mfg. Co.,

Battle Creek, Mich. Connectors are made of hard drawn special tough bronze of high copper content. Connectors have threads cut away from end of bolt to allow easy starting of nut. Thread edges are relieved and all sharp corners rounded off. Manufacturer states that tight contact is assured due to V-shaped bottom in wire slot, and thickness of nut assures a cross-section proportionate to strength of the bolt.

Sockets for 3-Light Lamps

A line of mogul sockets for 3-light lamps is announced by Pass & Seymour, Inc., Syracuse, N. Y. Sockets have two spring center contacts, accessible wiring

terminals, the same size as Catalog No. 1553 mogul socket. This makes it unnecessary to change reflectors when replacing sockets with 3-light lamp sockets. Sockets are available in three types as follows: Catalog No. 1555 with ⅜ in. cap; catalog No. 1556 with ½ in. cap, and catalog No. 1557 socket body only.

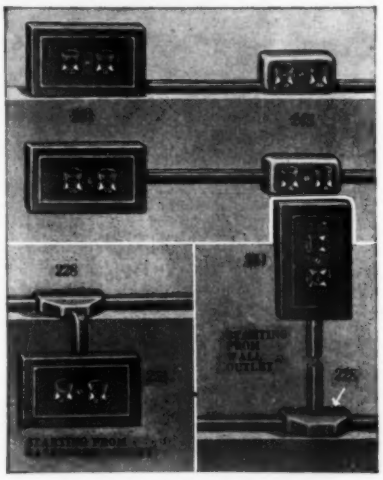
Brush Kits

Two brush kits known as Refrigerator Kits Nos. 44 and 45 have been placed on the market by The Ohio Carbon Co., Cleveland, Ohio. Kits contain brushes

for motors of all popular types of refrigerating units and are accompanied with a chart showing name of motor and proper brush therefor. The No. 44 kit contains 70 brushes for Delco, Century, DayFan, Wagner and Nizer motors and the No. 45 contains 160 brushes for the motors above mentioned as well as General Electric motors.

"Midget" Wiremold

The Wiremold Company, Hartford, Conn., has placed on the market "Midget" Wiremold, known as the 200 series, which consists of a surface conduit, constructed like regular Wiremold, with ten simple fittings, and furnished in 5 ft. lengths. Among the features of this Wiremold is a junction box which is adjustable to fit any thickness of baseboard, which fitting may also be used as a regular junction box; two invisible supporting fittings for fastening, one a coupling similar to a fitting used with



larger sizes of Wiremold, and the other a clip which may be located at any point along the run and "Midget" Wiremold snapped onto it, and thus held securely in place on any surface; and double twistouts on duplex receptacle and extension receptacle boxes, which latter feature permits a choice of either straight edge or center line installations.

600-Amp. Frame

Addition of a 600-amp. frame to the line of industrial circuit breakers now being manufactured by Square D Company, Detroit, Mich., is announced by the Switch & Panel Division. This completes its line of breakers from 15 amp. to 600-amp. These breakers are available in 230 and 575 volts a.c. and 125-250 volts d.c. and in 3 and 4-wire solid neutral.

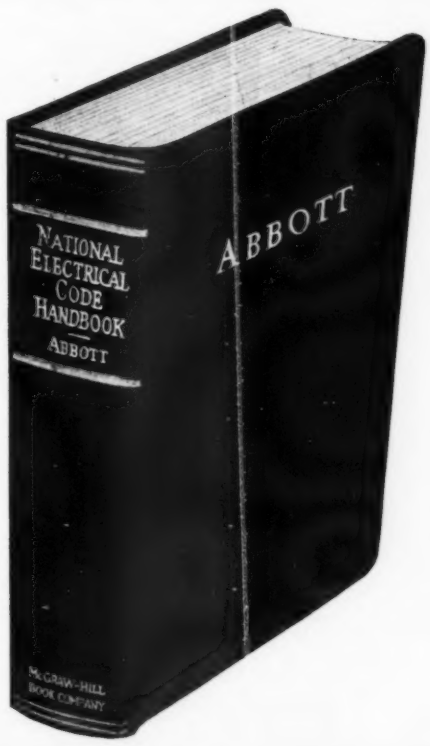
Time Switch

Kato Engineering Co., Mankato, Minn., has placed on the market an automatic on-and-off synchronous 25 amp. single and double pole time switch, furnished with 8-day spring wound tim-

ing units. Switch is encased in lacquered finished steel cabinet with padlockable catch. Weather-proof cabinets can be furnished for outside installations with automatic heating elements. Unit is also built in 2-circuit type. Each circuit has its own dial and trip lever built on one panel and controlled with one timing unit.

Coming Soon! New Second Edition covering latest Code rules

Simplifies and explains the National Electrical Code



Valuable data for the electrician, inspector, contractor and architect

—definitions of the terms used in the Code

—types of wiring approved under given conditions

—requirements pertaining to standard materials and apparatus and to the standard methods of installing such materials and apparatus

—general requirements applying to all wiring systems

—automatic overload protection covered both in section on general requirements and in connection with specific applications

—simplified application of Code data pertaining to motor installations

—special requirements pertaining to outside work, hazardous locations, theatre wiring, elevators, cranes, signs, radio equipment, etc., etc.

Soon to be published—a complete revision of Abbott's useful Handbook, covering all changes, new rules, etc., in the latest National Electrical Code. Use this book to get work done according to the Code. Gives rules and requirements for all jobs—what they mean—how to apply them. This unusual book, planned for quick reference use by busy, practical men can also be used by anyone who wishes to make a thorough study of the National Electrical Code.

Abbott's National Electrical Code HANDBOOK

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THE purpose of this book is to enable the user to grasp readily the plan, scope and purpose of the National Electrical Code requirements, to present discussions of the rules wherever this will clarify them, and to make the practical application of the rules clear and easily understandable.

All requirements of the Code are included in this Handbook but have been grouped according to the subjects to which they apply. For instance, if you want to know the rules for wiring under certain conditions you can be sure that all of these are included in Section II of the Handbook. At the same time some of them are repeated in other sections in connection with more specific jobs. By this special arrangement you can refer to any point quickly with the assurance that no rule applying to the subject will be overlooked.

Every Code rule has been made clear and understandable. Comments, explanations, diagrams and sketches have been inserted wherever they are needed. Some rules have been restated where the meaning could be brought out more simply.

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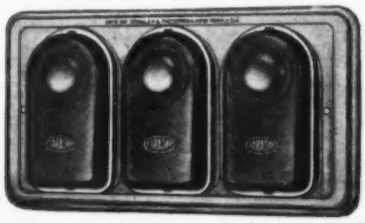
UMI

April New Products

Residence Call Panels

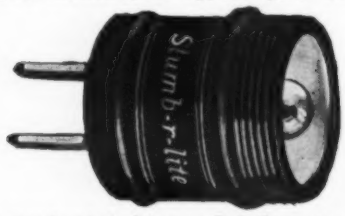
Stanley & Patterson, Inc., 150 Varick St., New York City, announces Faraday residence call panels in one-unit, two-unit and three-unit sizes, for surface mounting. Panels have hollow backplates formed with molded edges, com-



pletely covering up slackwires and broken and uneven plaster. Units are insulated from backplates. Covers enclose the entire mechanisms as well as the gongs, binding-posts, etc., dustproofing the units. No mounting screws show on surface of panel. Standard color of back-plates of panels is ivory, while covers for the different sounding bells and buzzers are furnished in jade-green, blue or ivory. Dimensions of the three standard-size panels are as follows: One-unit (small) panel, 6¼ in. wide x 7 in. high; two-unit (medium) panel 9½ in. wide x 6½ in. high, and three-unit (large) panel 12 in. wide x 6½ in. high.

Nite Lite

HomE-Electrical Specialties Corp., 307 The Arcade Annex, Cleveland, Ohio, announces "Slumb-R-Lite," a nite-light for use in the home, factory, office, etc. Unit



is constructed of brown Bakelite extending slightly over 1 in. from the wall, and is equipped with the recently developed General Electric "Moonlight bulb", which is a 10 volt, .035 amp. Mazda all-nite-lite bulb, operating on either a.c. or d.c. Unit can be used in any convenience outlet or socket.

Kitchen Ventilator

Universal Blower Co., Birmingham, Mich., announces a kitchen ventilator known as "Stov-Dome" with an electric light under it, separately controlled, providing indirect illumination on working surface of range. Unit is built of special alloyed steel, rust-proofed, and finished in solid white, cream, ivory, gray or green enamel. Unit is complete with wall brackets, wood and toggle screws and an 8 ft. attachment cord for plugging into receptacle. Can also be furnished with 24 in. length pipe, adjustable elbows and pipe collars. Exhaust pipe is 6 in. in diameter. Type D unit

is equipped with a 6 in. fan driven at proper speed by an induction motor with enclosed case and bronze bearings. Motor has no brushes and has only one moving part and can be used at 110 volts, 60 cycles. Fan switch is located at the front, lower edge.

Relay

An electro-magnetic device known as the Faratron "Invisible Control" relay has been placed on the market by The Lumenite Sales Co., Chicago, Ill. Standard Faratron unit has an amplifier tube, a radio tube for ordinary purposes or

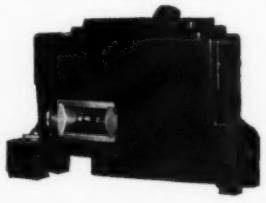
an industrial tube for critical application. Only one adjustment is necessary for proper operation. Units are furnished with power relays capable of carrying 30 amps. a.c. except where otherwise specified. Double outlets are furnished for normally on or off power loads. Unit is housed in a black steel case. The approximate size of unit is 7 in. by 6 in., by 6 in., and operates from 110 volts, a.c. or d.c.

Fuses

Jefferson Electric Co., Bellwood, Ill., has placed on the market a line of Super-Lag fuses, which incorporate a design principle that prevents blowouts until the current overload has continued for a sufficient space of time to be dangerous. The manufacturer claims that needless blowouts are eliminated and fuse costs are minimized, while at the same time safe margins of overload protection are maintained. Super-lag renewable fuses are made in all standard ratings in both knifeblade and ferrule types.

Industrial Circuit Breakers

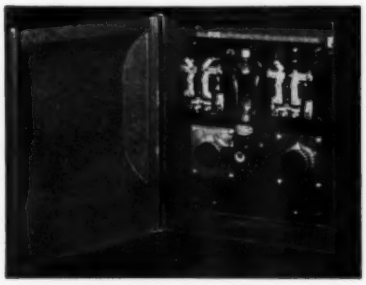
A line of compression type industrial circuit breakers known as type AF-1 is announced by the Trumbull Electric Mfg. Co., Plainville, Conn. Breaker is available in 1, 2 or 3 pole, 15, 20, 25, 35 or 50 amp. calibration. Other breakers



are available up to 600 amp. On overloads or short circuits a clearly visible target appears in handle opening, indicating breaker has been automatically tripped. An exclusive feature of the breaker is the method of arc-interruption. Contacts make and break in a closed metal cylinder. When breaker trips on overload the contacts part. The arc generates gases that set up pressure within cylinder which pressure increases resistance of the arc so rapidly that interruption occurs in .008 of a second.

Electronic Timer

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., announces type GA electronic timer which measures out a present length of time and closes or opens its contacts for that time after the initiating impulse given from a push button, foot treadle or cam oper-



ated switch. Unit is used for such operations as the timing of spot and projection welder current flow, X-Ray timing, etc. Time measured out is continuously adjustable from .1/10 second to 45 seconds. The industrial grid glow tube in the device operates the contactor directly without delicate intermediate relays, and tube is free from any effects of wide temperature changes. Timing is variable by means of a coarse and fine adjustment. The coarse adjustment consists of a tap switch for changing connections to fixed resistors and the fine adjustment is a wire wound potentiometer. The contactor in the unit has a contact capacity of 10 amps. at 115 volts and 5 amps. at 220 volts a.c.

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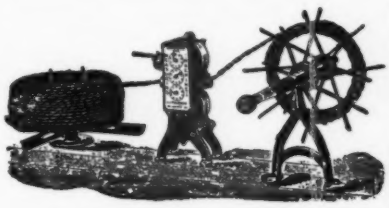

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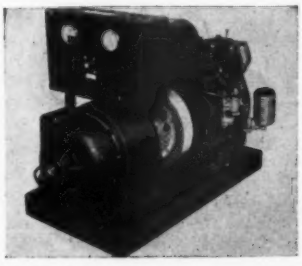

Illustration sho 300 watt size with remote control

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All Standard sizes; they can easily be clipped without damage to the Plug.
Our *Drills* are also of superior quality.
Prices and samples upon request, or ask your Jobber for "STRONGHOLD" Plugs and Drills.

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A catalog covering Chromalox heating units has been published by Edwin L. Wiegand Co., 7500 Thomas Blvd., Pittsburgh, Pa. The catalog has been planned and arranged to instantly find detailed information for applying heat electrically. It also contains installation instructions, suggestions and drawings for installation of heaters, as well as tables and charts. Each unit is illustrated and typical installations are shown. A price-list and chart for figuring heating jobs are also contained in the catalog.

W. B. Arbuckle with offices located at 1006 Washington Avenue, Houston, Texas, has been appointed as district representative for the Allen-Bradley Company, Milwaukee, Wisconsin.

Mr. Arbuckle will handle the complete line of Allen-Bradley control apparatus including manual and automatic alternating and direct current motor starters, rheostats, battery charging panels, relays and a complete line of control auxiliaries.

An 8-page booklet describing Luminous tube transformers has been issued by Sola Electric Co., 2525 Clybourn Ave., Chicago. Illustrations describing the units are contained in the booklet, as well as an approximate footage chart, electrical specifications and wattage consumption per transformer.

Pass & Seymour, Inc., Syracuse, N. Y., has added Walter M. Wyman to its sales staff. Mr. Wyman will cover eastern Pennsylvania, southern New Jersey and Delaware. Mr. Wyman was formerly connected with Harvey Hubbell, Inc.

"Standardize on* STANDARD *Transformers"

ALL TYPES
Indoor and Outdoor Service

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Announcing A REFRIGERATOR MOTOR BRUSH KIT

BRUSH KIT No. 45

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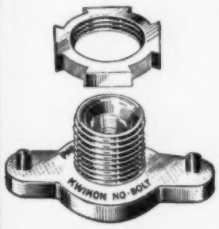

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Do you know how to:

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1,079 pages of practical shop methods and data on jobs like these in this library. A complete, up-to-date key to repair of all motors. Nothing else in it; every page filled with definite, practical facts for the industrial maintenance man and the electric shop worker.

4 volumes, $10.00, payable in easy monthly installments

THIS set of books should be on the shelf of every man who ever has to touch a motor for purposes of repairing it or changing it to meet different operating conditions. In shop language and with practical shop methods it covers every step in stripping, rewinding and connecting a.c. and d.c. motors of all kinds.

How to change motors for different operating conditions

Here is all the information you need in order to determine what changes various types of motors permit; to lay out new windings for specified service conditions; and to handle every step in the work with satisfactory results.

Covers all types of motors, from those used in small household and commercial appliances of all kinds, to mining and railway motors. Explains principles underlying the different types of windings; gives definite instructions for doing the various rewinding jobs. Also gives many data, tables and diagrams constantly needed by the repair man, including data difficult to get from any other sources.

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"That's the Kind of Equipment that's Causing the Trouble!"

We know that executives are out in the industrial plants today—probing delays—checking time and labor losses. They are learning, first hand, how electrical equipment has deteriorated from lack of proper maintenance.

But this movement has gone further. Owners of office buildings, apartments and homes are finding old equipment inadequate for the various services and appliances of the modern, electrically equipped office or home. Old and new installations must be made to serve future as well as present needs. Sub-standard or obsolete switches will not meet the requirements.

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Call in a Square D man at once—there's no obligation.

Here is the modern meter service switch, providing capacity and circuits for the electrically equipped home.

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ELECTRICAL EQUIPMENT

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General Electric Soldering Fluxes are convenient, efficient and economical. No second "dips" are required. G-E Core Solder saves time and money.

All the insulating materials recommended by General Electric are the same as those used in the manufacture of its products and equipment.

For further information on G-E Tapes and Solders see your nearest G-E Merchandise Distributor. Or write Section M-194, Merchandise Department, General Electric Company, Bridgeport, Connecticut.

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INSULATING MATERIALS

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

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